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NEWSPAPER

NEWS IN BRIEF

Ward Pleads Guilty To Trade Secret Theft

OAKLAND, Calif. – Hugh Jeffrey Ward has pleaded guilty to the felony charge of stealing trade secrets, after being charged with tapping a time-sharing computer and stealing a program.

A grand theft charge was dropped when Ward pleaded guilty to stealing a trade secret, according to officials in the Alameda County District Attorney's office.

Ward's employer, University Computing Co., was fined some $300,000 last August in a civil trial in which UCC claimed the program was not a trade secret because its code was printed in a newsletter by Information Systems Design, Inc., plaintiff in the case and a competitor of UCC.

Court papers indicated that Ward was able to tap ISD's computer because both ISD and UCC had a common customer, who was assigned the same password by both vendors.

Ward reportedly used the customer's password to access the ISD data base and receive a copy of the proprietary program.

CSC Chairman Fletcher Jones Killed in Crash of Plane

LOS ANGELES – Fletcher Jones, 41-year-old chairman of the board of Computer Sciences Corp. (CSC), was killed last week when his private plane crashed in Santa Barbara County.

Jones, who started CSC with a $100 investment in 1959, was flying his plane from Santa Monica to Santa Ynez Airport when the plane reportedly crashed into a hill eight miles from the airport.

Business associates said the only person aboard the plane was Jones.

Privacy Proposition Passes

LOS ANGELES – Voters here last week approved a proposition aimed at protecting the public from invasion of privacy through such means as centralizing and computerizing information.

The proposition will add privacy to Californians' inalienable rights in the state constitution.

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'DAT Box' Could Bring VS to 360s

By Ronald A. Frank
Of the CW Staff

NEWTON, Mass. – Independent suppliers may soon have good news for 360 users who would like to add a virtual storage capability to their systems.

Such 360 enhancements, which would allow the mainframes to operate in a virtual mode, much like their 370 successors, would depend on the Dynamic Address Translation (DAT) function.

While most independents and leasing companies admit more than a passing interest in DAT "boxes," as they are called, it is believed that few now exist. Several users have already been "quoted" DAT boxes by independent vendors but it is not clear whether these contacts could be backed up with a working product or whether they were strictly trial balloons.

Hardware or Software

A virtual storage capability for 360s could be implemented via either a hardware or software product, according to observers. It is generally felt that a software version would be more expensive to implement.

Part of the problem lies in the 370 VS instructions that cannot be duplicated in the 360 OS instruction set. Any software that would make the non-compatible instructions operate with 360 virtual storage systems would be very expensive for the user.

But a more feasible solution appears to be a hardware DAT box. "A 360 system with a hardware implemented virtual storage capability would probably run rings around a comparable 370 system," according to one design expert. "In terms of raw response time it would be a better machine," he said.

Spotlight on User's Lib

A hardware virtual system with modern semiconductor or domain tip technology instead of a drum technology (such as a 2305-type device) would be low priced, one source said. This system would require no software changes and would operate like a buffer memory handling just "raw paging."

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DP Voting Mostly a 'Smooth' Show

CW Staff Roundup

Early analysis of computer-based voting systems indicates that they counted more votes in more places and more successfully, in last week's national election than ever before.

But even though most systems appeared to work up to or beyond expectations, there were a few isolated cases where dampness slowed the count and at least one case where it appears that voters intentionally tried to "foul up" the system.

A major problem was in Harris County (Houston), Texas, where some names were reversed on the ballots and where the entire vote is being challenged on the basis of irregularities in the vote-counting system.

In the races for state senator and state representative, a member of the county Board of Elections said the names of the candidates were in the wrong position, but the numbering of the ballot was correct.

In one case, the Republican's name, for example, was supposed to be in one position, but was transposed and the Democrat's name appeared in that area.

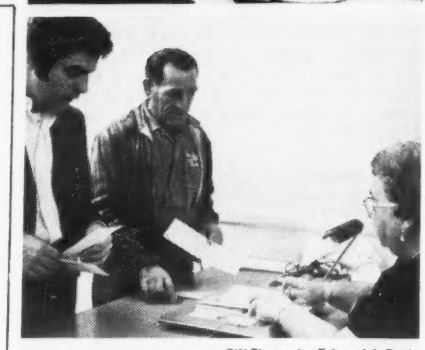
In all, 517 voters had marked their ballots before anyone realized the error. All of the other ballots were then corrected by hand to make sure the proper candidates were in the proper position.

The number of misprinted votes would not have affected the outcome of the race in any manner, the member added.

Except for that foul up, the system worked very well, officials noted, even though Harris County was a first-time user of punched card voting systems. The system, however, was somewhat printer bound and the entire results were not printed out until 5:30 Wednesday morning, according to officials.

At the same time, though, there appeared to be voter resistance to the system and several ballots seemed to be intentionally mispunched by disgruntled voters, the board member noted.

In some cases, voters had punched the number-hole in the card which was used to identify candidates, officials said. This would have been impossible if the voters had inserted the punched card in the frame as directed.



CW Photos by Edward J. Bride

Learning about punched card voting seems to be a new, and perhaps puzzling, experience for some voters in Watertown, Mass.

Delays up to two hours were reported in Washington, D.C., because humidity swelled the marked cards that were to be scanned.

After the cards had dried and shrunk to normal size, processing continued, ac-

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More Panels, Tutorial

1973 Caravan Expanded

By a CW Staff Writer

NEWTONVILLE, Mass. – Computer users will spend twice as much time in panel discussions and workshops during the 1973 Computer Caravan, as a result of expanding last spring's morning-only conferences.

Besides extending workshops into the afternoon, two new panel discussions have been added, and a tutorial on "Planning for Data Communications" has also been added to the caravan's forum.

Gilbert H. Hoxie, a manager in the Information Systems Division of Booz, Allen & Hamilton Inc., will deliver this tutorial in all 10 cities to be visited by the caravan, which is sponsored by *Computerworld*.

In announcing a modified format for the 1973 series of computer users' forums and expositions, *Computerworld* said every change was the result of recommendations by users attending last spring's sessions, including new software and small-user panels.

The communications planning session will not be of a "keynote" nature, but has been scheduled for the afternoon of the day preceding the regular data communications panels and workshops, according to Forum Manager Edward J. Bride.

This general session will be open to every person eligible to attend any portion of the caravan, e.g. exhibits or forum, he noted.

By speaking during a session at the end of the day, Hoxie will not be restricted by a tight schedule of panels and workshops, Bride noted.

Instead, users will have a chance to meet and/or question Hoxie, and use the information during an entire day's meetings to follow the open general session.

Hoxie has been with Booz, Allen &

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Computer-Based Voting Proves To Be Mostly a 'Smooth' Show

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cording to *Computerworld* election observer William McCloskey.

Elections Commissioner Charles B. Fisher said adjustments had to be made to the scanner so it would accept the cards before they actually shrank to original size. He also suspected the paper was "not of the density or quality required."

Fisher also denied reports that as many as 20,000 voters were disfranchised because their names were not included on final voter registration lists, which were also computerized.

Although he could not explain the missing names, he said all voters were provided with "challenger" cards, which would later be verified manually.

In Athens, Ohio, election officials reported swollen and damp cards slowed the card reader "considerably," but noted even with the delays they had the complete results by 10:30 Tuesday night, a record time.

"Even the secretary of state was surprised when we called him up with the complete results," an election official declared, claiming: "We beat most of the state by four to six hours."

Worked 'Great'

In Boone County, Mo., the punched card system worked "great," according to election Commissioner Murray Glascock. However, he reported some problems with the instructions that came with the program even though the program worked fine.

In all, he said, interpreting the instructions cost the center about two hours of processing time. "But without the computer system I think we would still be counting votes," he said late last week.

An official in the Missouri secretary of state's office indicated several counties in the state were now regretting they did not turn to the computer-based systems after they were approved by the secretary's office last year.

"With all of the ticket splitting we had," he said, "the returns from the paper ballot areas were extremely slow; most people were working all night."

In Watertown, Mass., election workers were reported to be brushing chads off the back of Votomatic cards, a possible violation of election rules.

While it was not known whether the chad had two or three corners hanging from the card – a criterion for giving workers permission to remove the entire piece – observers noted election workers were neglecting to inform voters how the chad should be removed.

An official of a company which markets Votomatic equipment was also on the scene, and repeatedly informed the instructors that the voters should be reminded to hold up the cards, viewing them from the back, to ascertain the condition of the chad.

One worker replied the voters were simply not doing this, and so the workers gave up and checked each card themselves for hanging chads.

Voters observed by a *Computerworld* reporter were generally amenable to using the punched cards, although in some areas explanations had to be repeated two or three times. This problem was lessened since many voters had used the gear four or five times in the past, and it was estimated that fewer than 10% needed instructions.

There were still lines in these precincts because of delays within the voting booths.

In Los Angeles, the largest computerized voting district in the nation, the election went off with barely a hitch as 2.8 million ballots were tallied.

Semi-official final totals were completed at 6:30 a.m. Wednesday, an hour-and-a-half earlier than any previous total under any kind of vote-counting system used by the county, officials claimed.

System Analyst Loses As 'DP Candidate'

REDFORD, Ill. – In a race between "seniority and the computer" seniority won here last week as incumbent Congresswoman Martha Griffiths defeated systems analyst Ralph Judd.

One of the issues in the campaign was the computerized vote-counting system used in Redford which "misplaced" votes during the primary election.

Judd used this as an example of how widespread computer use has become and how little elected officials knew about the techniques.

He ran a strong campaign based on the idea that there should be at least one congressman who is familiar with computer techniques and their social implications.

However, the voters thought otherwise, even though Judd late last week was planning to look into some of the procedures used in the counting system.

Returns being posted on tote boards behind NBC television commentators are monitored in control room (above) at NBC Election Service in New York. The room includes Univac Series 70/752 video data terminals for making inquiries into the system, and television monitors. Richard Groppa, NBC's administrator, election assurance, examines data with Ronnie Whitson, systems analyst for Univac. Election returns were handled by a Univac Series 70/45 computer (right) at NBC headquarters. The computer received returns from the National Election Service in New York and drove the tote boards which showed returns by state for the presidential, senatorial and gubernatorial races, plus 435 key House contests.

Election Coverage: From Voter to Voter

John J. Coughlin, deputy director of the county data processing department, said the processing was "beautiful . . . smooth all evening."

The only problem was with a flaw in a tape and the ballots on the tape had to be reprocessed, which took an extra half hour.

There was no central processor downtime and Coughlin said there was a smaller – less than 1% – number of damaged punched card ballots.

During the evening, 140 to 150 tapes were processed. Readouts were made every half hour.

The IBM 370/155, Coughlin said, was never backlogged, a problem with summary computers during past elections here.

Alameda County, Calif., reported no major problems, even though election officials reported mounting one tape "backwards" which had to be reprocessed from the cards.

Klakamas County, Ore., reported smooth running despite a "crash" that brought the computer down for around 10 minutes.

1973 Computer Caravan Expanded

(Continued from Page 1)

Hamilton for four years, and has specialized in data communications marketing and design for both providers and users of complex information systems.

Among his recent projects were microwave studies, data transmission studies for the retailing industry, time-sharing programs to model and project communications needs and a current project to plan a worldwide data network.

The actual makeup of the remainder of the forum will resemble the 1972 version. Keynote speakers have been eliminated as such, however, simply because users wanted to spend more time in face-to-face discussions, Bride said.

"The keynote speakers served a valuable purpose" in the 1972 caravan, he related, "but the users felt we were trying to put too much into our schedule."

The open afternoon sessions, one on each day, will run for about an hour-and-a-half.

Opening day panels and workshops will be devoted to data entry, with the tutorial on communications given after workshops have concluded.

On the middle day in each city, data communications will be the theme of the panels and workshops. Upon completion of these, an open general session will feature a panel discussion on software evaluation.

The third day's theme will be installation management, with panels and workshops on such aspects as personnel recruiting and training, programming management and independent peripherals.

The last open general session will be a panel discussion on small systems usage.

To make this panel more interesting, a discussant or "devil's advocate" will pose problems or ask questions of the panel of users. The panel will be comprised generally of experienced users of small, general-purpose computers, minicomputers for general business use and turnkey business systems. The discussant will be in one of those categories also.

Panelists are currently being recruited for the 1973 meetings, which begin in Boston Feb. 13, then visit, in order, Washington, D.C., New York, Atlanta, Houston, Anaheim, San Francisco, Kansas City, Chicago and Cleveland.

Extortionist 'Unearthed'

By Michael Merritt
Special to Computerworld

SEATTLE – Canny use of a computer helped find one man out of thousands and convict him of extortion.

The extortion plot began early this year with a series of hand-printed letters sent to officials of the Boeing Co., threatening to blow up a Boeing plane unless the company paid the extortionist $50,000. One note arrived in a bouquet sent to Boeing President T.A. Wilson, giving instructions for delivering the money. When Boeing didn't ante up, other notes and threats followed.

FBI investigators teamed up with Boeing personnel to find the extortionist, according to Laurence Finegold, assistant U.S. district attorney in Seattle. Checking at the flower shop that provided the bouquet, the FBI obtained a description of the criminal – a man, about 55 to 60, with a kewpie-doll face.

Then the investigators made some assumptions – the extortionist was a disgruntled former employee. Cross-tabbing Boeing's payroll files for former employees of about age 55 produced several thousand names.

So the investigators made more assumptions. The block lettering indicated the man might be a draftsman or engineer – a smaller group of possibilities, but still many thousand. Poor spelling and grammar in the notes led to the assumption that the extortionist was a draftsman, and postmarks and the location of the flower shop indicated he lived near Renton, Wash.

The run produced a reasonable number of people meeting all these criteria – 50 altogether. One of them was James H. Finnegan, 57, who had worked for Boeing for two years, and was laid off in 1969, Finegold said.

Finnegan was identified by the woman who sold him the flowers, and was later convicted of sending extortion letters through the mail and threatening injury to persons and property, according to Finegold. He received a sentence of 20 years, and is currently undergoing a three-month psychiatric evaluation, the assistant district attorney stated.

Chinese Translation Aided

HONG KONG – The University of Hong Kong computer center has developed a technique for computer translation of mathematical texts from Chinese to English. Translation from English to Chinese is in the planning stage.

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Mysterious Tapes, Bribery Charges...

'Fort Wayne Computer Affair' Leaves Sour Aftertaste

By Michael Weinstein
Of the CW Staff

FORT WAYNE, Ind. – Charges of "sweetheart deals," bribery, corruption and mysterious tapes were some of the ingredients to a computer acquisition here.

The "Fort Wayne Affair" started innocently enough when Tom Lewis of the Public Works Department decided it was in the city's best interest to get a larger computer to convert its programs from RPG to Cobol.

Besides larger system flexibility, Lewis emphasized he was trying to get an $8 million grant for urban renewal which required a larger computer facility.

Specifications for the new system were decided upon and bids were requested. NCR won the contract with a Century 101 system that offered twice the memory and twice the disk storage at less cost than the city's present IBM 360/20.

A contract was signed and Lewis looked forward to his new computer. Little did he realize that his efforts would spark political charges and counter-charges that would have computer companies throughout the Midwest holding their collective breaths.

Rumblings of a Deal

The first rumblings began when city councilman Donald Schmidt charged that the mayor was trying to run the computer deal through without city council approval.

The local paper – the *Fort Wayne News Sentinel* – picked up Schmidt's charges with a front-page headline: "Schmidt Smells 'Deal' In Computer Contract."

In an expose story, the paper reported how Schmidt learned that NCR had given the city "190 free hours" of computer time before the deal was finalized. The implication was that someone was getting a kickback and that the free time might possibly have been used by the mayor for voter registration programs for the Democratic party, according to Schmidt.

Schmidt accused the mayor of "being a political boss trying to ram the new computer through the council" and stressed the council's responsibility to protect the people's rights.

When it was pointed out that the new computer had more "firepower" at less cost, Schmidt stated he was sure IBM could have matched the offer if given the chance.

IBM was in fact given a chance to bid and lost the contract. IBM stated it offered the city a System/3 that was rejected because it was felt it did not provide the Cobol capabilities the city needed.

Bribery Charges

As demands for a full investigation rose, the mayor added a new dimension to the tale by disclosing that he had a three-month-old tape recording of another councilman – Roger Bruck – attempting to bribe him to choose still a third vendor.

With this new disclosure, Fort Wayne citizens read "Bruck Says Mayor 'Set Up' Meeting to Silence Him,"

The *News Sentinel* reported how Bruck claimed he was "set up" because he had been stopping the purchase of new computer equipment ever since he took office. "Every few weeks I (Bruck) would get word the city was going to sign for additional equipment and I would do something to stop or slow the procedure."

Schmidt claimed the mayor's disclosure about Bruck was a ploy to take the heat off the computer deal. He demanded to know whether the mayor was trying to blackmail the council and the cries for a full investigation grew even louder.

Bruck's case was not helped when a copy of the mysterious tape appeared at the *Sentinel's* office where Bruck was identified stating he was a representative of a third computer company that would give the mayor $1000/mo if he would change the contract, the newspaper reported.

Richard Kohrman, director of the county data processing facility, then presented figures which proved the city could save large sums of money if it would take out a 15-year contract on an IBM 370/145 to be run by the county.

Showdown

A showdown meeting was held to determine why Fort Wayne had changed from an IBM 360/20 to a Century 101.

The mayor's side offered the following reasons:

- The NCR system was $12/mo less than the IBM system.
- On test programs, NCR performed city programs in about six minutes compared to as much as 48 minutes for other computers tested.
- NCR's offer included a CPU with 32K, 60M bytes of disk storage, two tape drives and a 900 line/min printer compared to the 360/20 with 16K memory, two 2311s, a card reader and a 300 line/min printer.
- The NCR system would allow the department to write programs in Cobol whereas earlier they were limited to RPG. This would make the work more compatible with other systems in the county.

City councilman John Stier stated NCR had given the city 96 hours instead of the alleged 190 hours. This was broken down into 20 hours for benchmarking and the rest for testing and debugging the program for community renewal which was too large for the old system.

This program was needed to help the city gain the $8 million urban renewal grant, according to Stier.

At last report, Councilman Schmidt was not completely satisfied and was demanding that the mayor make a full apology to "himself and to the computer firms."

The computer firms involved would just as soon forego the apology and forget the whole thing. They are still slightly in shock over the scope of the whole affair.

Councilman Bruck is referring all questions to his lawyer.

The mayor has his contract for the NCR system.

Tom Lewis, the "catalyst," will have his new NCR machine. He is undismayed by the whole affair and is debating how to convert his programs.

And the entire "Fort Wayne Computer Affair" has been swept away like the proverbial dust in a windstorm – except, as one midwesterner stated, "the word computer has taken on a rather sour note in this city."

Freeze May Be on Alaska Justice Plan

By Edward J. Bride
Of the CW Staff

ANCHORAGE, Alaska – A new statewide criminal justice system is being tested here, but communications problems may delay full implementation.

The biggest problem is apparently sporadic noise in the long lines, but developing security guidelines to protect citizens' rights to privacy is also getting much emphasis, sources said.

Donald King, of the research and development section of the Department of Public Safety, said a right-to-privacy amendment in the state constitution was not delaying full implementation of the system, although other local sources hinted this could be a cause for delay.

The only problems being encountered, King said, are in the operational tests currently being conducted, and these are mostly noise problems.

He also said some telephone calls have been terminated or transferred to other people in the middle of a call, for no apparent reason.

These are the same telephone lines that will be carrying sensitive information to users of computer terminals, sources indicated. This data includes the usual police information, collected during contacts with the criminal justice system. Licensing and other such "contacts" will also be included, King said.

When implemented, the comprehensive system will be based in the state's DP division, part of the Department of Administration, where an IBM 360/40 performs general DP duties for many state users.

There are currently 22 terminals hooked into the computer, King said, noting plans call for a total of about 50 terminals, including both video displays and the slower teletypewriter terminals.

Local Operation OK

The files are up and operating, and locally the system is performing adequately, King related. Within a few hundred miles, terminals are connected via leased lines, but beyond that distance, the plan calls for dial access, he said.

Called the Alaska Justice Information System (Ajis), the system carries strict security precautions, including criminal penalties for misuse of data, King said.

A statute authorizing development of the system mandated that only justice matters may be filed, and such files as welfare may not be added or interfaced, King said. Though the state does have an income tax, he continued, there can be no use of this data in the Ajis data base.

Included in the data base will be all forms of state licensing, as well as arrest data, court calendars, and corrections information, plus, eventually, motor vehicle data. Implementation is about 40% complete on a four-year timetable, he added.

About half the money for Ajis came from the Law Enforcement Assistance Administration (LEAA), and the grant stipulated – as most LEAA grants do – that matching funds be spent by the state. About $750,000 was authorized for Ajis, he said.

Manual Interface

Alaska State Police currently have a manual teletypewriter terminal that communicates with the FBI's National Crime Information Center (NCIC), and the overall Ajis design is that the several trooper terminals will eventually do the same, through the state's 360/40.

Before this can be accomplished, however, the state will have to prove the configuration can pass the FBI's security guidelines, especially with regard to the computerized criminal history file.

While there is a minicomputer being used for statewide message switching, King said the Ajis plans call for NCIC access through the 360/40.

If this is to be approved by the FBI, then the state police, or the Department of Public Safety (DPS), would need to work out an arrangement with the Department of Administration, giving DPS hire/fire authority over the computer center employees.

'DAT Box' Could Mean VS 360s

(Continued from Page 1)

One approach reportedly being considered by some independent vendors includes installing a hardware DAT box in a 3330-type controller. Presumably this would allow the virtual capability to be kept entirely outside the mainframe.

One problem with any DAT box would be its impact on IBM maintenance. But most independent suppliers feel this problem has been mostly solved with add-on memories, and an add-on DAT box, they believe, would not harm system maintenance.

Smaller Model Problems

There is general agreement that a DAT box would fit nicely on a 360/65, and many independents think a virtual version of the Model 50 would also be feasible. On smaller models in the 360 line there is some disagreement. Some observers feel the architecture of the smaller systems like the Model 30 and 40 do not lend themselves to virtual operation.

But one firm is reportedly working on an "upgrade kit" that would allow a Model 30 to operate in virtual mode with the performance of a Model 40. There is naturally no guarantee that this is what Model 30 users are waiting for. In fact, many 360 users may not be the least bit interested in virtual operation.

But the potential of the DAT box cannot be ignored. One observer feels the first such system will combine "firmware, software and hardware changes."

It is almost a foregone conclusion that a DAT box will soon be available – probably within the next year. It will then be up to the user to evaluate the true potential of a 360 virtual capability.

DP Controls Texas Energy Network

SAN ANTONIO, Texas – The City Public Service Board, serving 362,000 electric and gas customers in a 1,500-sq-mile area, is one of the first utilities to use advanced computer technology to control an energy network.

Under the system an operator performs all control functions by touching a light pen to a CRT display. By touching the display an operator can summon details of any of 80 remote control points throughout the network and operate various circuit breakers or regulators.

In an emergency, the computer-controlled system automatically causes an audio alarm to sound and displays a diagram of the network onto one of the CRTs.

If, for example, the emergency involves an open circuit-breaker in a remote station, the operator can use his light pen to call up a detailed diagram of the section on a second CRT.

The operator touches this second display and the computer prints out the control options for minimizing the impact of this failure. The operator selects one of these options and executes it with his pen.

The computer system then automatically performs the necessary control functions and logs the procedure for future reference.

Two Xerox Sigma 5 computers, sharing a common memory, form the center of the system. The two computers, each with 32K words of private memory and 32K words of shared memory, constitute a "mirror image" system in which all components are duplicated.

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DP and the Handicapped — Part II

Program Trains Disabled in Programming, Data Entry

By E. Drake Lundell Jr.
Of the CW Staff

WASHINGTON, D.C. – Discussions of future employment opportunities for severely handicapped persons through the use of computer-communications links are commendable, but the handicapped need jobs now.

What can be done, today, in this economic environment?

This problem has been the subject of a small research project sponsored by the Social and Rehabilitation Service of the Department of Health, Education and Welfare, and so far the results have been impressive – and practical.

The program was basically designed to find out what possibilities are available for the severely disabled individual, according to Thomas R. Shworles, assistant research professor of medicine at George Washington University and the principal investigator in the project.

The primary results of the project which trained programmers and data entry personnel, according to Shworles, are:

- "New work tools do lead to new productivity by the physically limited worker.
- "The information industry product is novel in that it requires far less dexterous handling than most other typical homebound activities.
- "These jobs are in demand and in parallel with the changing job market.
- "Work performances by the disabled worker are competitive and therefore earnings are significant and meaningful.
- "Training programs are short.
- "Training and equipment costs are in line with conventional vocational rehabilitation program costs."

Specifically, Shworles outlined the results from two recent training experiments designed to teach severely handicapped individuals computer programming and OCR typing skills.

New Ingredients

"The simple use of new ingredients – a terminal, self-instruction booklets, a time-sharing computer, the household telephone and a systems representative from the computer company – enabled six persons in this project to acquire computer programming or data entry abilities within three months, without the expensive and nearly impossible burden of traveling to classes," he reported.

The average cost of the training, he said, amounted to around $1,000, which is approximately 50% less than has been required to train less disabled persons in these skills.

"The training approach designed in this research project allowed the homebound students a learning advantage not commonly found in most computer programming courses – daily and frequent access to a computer" through slightly modified terminals placed in the homes, he noted.

Five of the six trainees are now employed full-time with an average salary of $4.66/hr. One of the six is the first full-time homebound employee to be hired by the Federal Government ("a former mine worker so severely limited by spinal cord injury that he is unable to write his signature"), Shworles said.

As a specific example, Shworles pointed to one of the men in the course, a 24-year-old who "has overcome the real functional limitations imposed by juvenile rheumatoid arthritis and marie strumpell spondylitis (minimal head motion, frozen knee and hips, limited arm motions, fair grasp and dexterity in the right hand, and good grasp and dexterity in the left hand)."

He "has contracted over 2,600 hours of language programming" since completing the course, Shworles said, "and is supporting himself entirely with earnings at a 'professional' level."

90% Mental

More than 90% of the programmer's job is mental, Shworles noted, indicating that the remaining physical activities rarely require more than minimal strength or coordination.

But not everyone can be a computer programmer, which takes a logical mind and some intensive training. This is where training in such areas as OCR typing and keypunching have been prominent.

Cost estimates, Shworles explained, "show that 30% to 50% of the data processing dollar is spent on data entry" which led the program to determine that "OCR typing is recommended as another area for homebound employment."

"Equipment is relatively uncomplicated. A standard IBM Selectric typewriter . . . , a conventional work skill (capacity to type accurately between 40 and 60 words per minute, a work product which is easily transportable, and work routines conveniently supervised over telephone by the employer, all combine into a new low-cost work option for the homebound person," he said.

The two workers trained for data entry work in the project had been unemployed for an average of 16 years, before the training, but both have now worked for almost a year.

"One of the workers is a 39-year-old paraplegic and wheelchair-bound married mother of three young girls," Shworles said.

"Duties of mother and housewife, inability to use public transportation, and living in a second-floor residence frustrated any chances for conventional training or substantial employment in spite of the urgent need for added family income."

By using a combination of audio cassettes supplemented by printed visual matter, plus weekly supervision by telephone, she was able to reach a typing speed of 60 word/min in 10 weeks for a total cost of training that amounted to $96, he said.

Homebound Job

"As an initial introduction to the modern work world, the project located for her a 374-hour homebound job (seven months at $3.20/hr) typing aged, technical documents before they were microfilmed.

In her present OCR input job, she reads data from source documents, mentally codes this data according to instructions on an enlarged sheet hanging on the wall in front of her, types it at the rate of 350 line/hr, works 25 hr/week (her full capacity), and averages $4.06 net/hr, Shworles reported.

The project has shown, Shworles said, that "opportunities for competitive employment will increase in numbers and in universality for homebound, physically disabled persons.

"The process of designing ways for the worker to transcend his physical limitations by means of technological innovation is providing homebound persons broad worldwide opportunity for work which is productive, secure, flexible and fulfilling."

Church Enlists DP To Involve Members

KANSAS CITY, Mo. – Father Joseph Champlin, a parish priest of the Holy Family Catholic Church, and a local firm are using a computer to involve more people in the life of the parish.

Results of a computer survey were surprising. One or two outspoken opponents of certain reforms had given the impression that the entire church was against those reforms, and many people were unwilling to speak out publicly, according to the priest.

Using the computer survey the church found that the vocal opinion was not shared by the majority.

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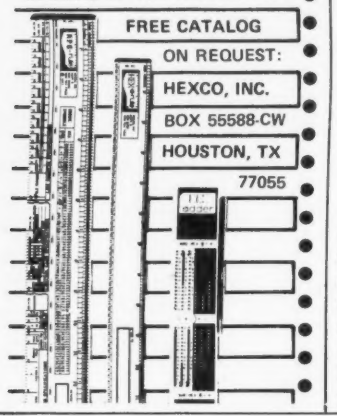

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User Community 'Bypassed'

Ansi Proposes Revisions in Ascii Character Set

By Donald A. Leavitt
Of the CW Staff

WASHINGTON, D.C. – The American National Standards Institute (Ansi) technical committee X3L2 has proposed several revisions in the Ascii character set and functions and the public comment period on the proposed changes with the committee's own balloting period.

The consideration of the revision also coincides with the start of the National Bureau of Standards' study of the impact of Ascii as a federal standard [CW, Nov. 8].

The revision in effect acknowledges suggestions made to NBS that Ascii should be defined as an 8-bit code. The standard includes a note that representation of 7-bit Ascii "in an 8-bit environment" has already been included in another Ansi standard, X3L2/1199.

The proposed revisions in Ascii are not major, but the fact that the X3L2 group is "bypassing" the user community and any comments it might have on the changes is very serious, in the view of at least one industry observer.

Several of the changes provide alternate uses of line feed, form feed and vertical tab functions, which could cause some problems in preparing printed output.

But another revision, weakening the strictness of the current rules on collating sequence, has an added importance. It re-emphasizes the fact that Ascii is intended to be a processing code and not just a communications code, the observer noted.

Under the current rule, collating sequence is defined as being absolutely dependent on the binary values of each character's bit patterns. The proposed wording states that the binary value shall be the default value "where there is no application dependent requirement that determines the results of relative high-low magnitude comparison."

With the new wording, Ascii in effect loses its status as a standard that was to encourage the interchange of data and programs between machines. The receiving user has to know the details of the processing to determine if there are any "application dependent" requirements that would override the binary sequencing of the data.

The Line Feed function, in which the page is spaced up "in place" without a carriage return, is to become the secondary use of the 0/10 character. "New Line," including a carriage return, will be the prime use of the character under the revision.

In the same manner, Vertical Tab and Form Feed functions will include a carriage return, so that operations start at the first position of the next line (or form) rather than directly "below" where they ended on the previous line.

The carriage return function itself will be known simply as Return, with a mnemonic of RT, perhaps to avoid confusion between the old CR mnemonic and the entry of a credit notation.

In a move that might be interpreted as defying IBM, the committee proposes to change the graphic for vertical line from a broken line to a solid line. The latter is used in IBM's Extended Binary Coded Decimal code (Ebcdic) as the symbol for a Logical OR.

In other details, X3L2 has dropped the coding from the British pound sterling, which is no longer in use, and has included a provision to replace the U.S. dollar sign with a lozenge as a symbol of whatever local currency is being reported.

The proposed revision of the Ascii standard is contained in Ref. Document No. X3L2/1278, released to X3L2 members and alternates on Oct. 20, by Hubert F. Ickes, of IBM-Poughkeepsie, leader of the committee's "project 12" (Ascii).

Comments from users should be directed to Ickes, Dept. B18/Bldg. 7072, P.O. Box 390, Poughkeepsie, N.Y. 12602, or to Robert Brown, Director of Standards, Bema, 1828 L St., N.W., 20036.

Child Support System To Tie Many Agencies

Special to Computerworld

LOS ANGELES – An automated child support management and information system is planned here to crack down on parents who abandon their families and force them to go on welfare.

The county Board of Supervisors has approved plans for development of a $2 million system that is expected to save taxpayers $2.5 million annually.

The system will involve the coordination of numerous federal, state and local justice, law enforcement and welfare agencies, according to District Attorney Joseph P. Busch.

Tie-Ins Seen

"I anticipate that such a system as this would tie in with systems operated by the state Department of Motor Vehicles and the state income tax computer system," Busch said.

"Sooner or later, even if an absent parent is trying to remain out of sight, they are going to have to pay taxes, renew driver's licenses or make some other transaction which will help us find them."

DP Converts 3d Down Play Into First-Rate Analyses

ST. LOUIS, Mo. – Number 6600 is considered a valuable member of the Cardinals' football team, though he never actually appears on the playing field.

Hardly the run-of-the-mill benchwarmer a CDC 6600 computer at McDonnell Douglas Automation Co. provides prompt analysis of trends noted in games of forthcoming opponents, and is credited by defensive coach Bill Leach with giving the Cardinals four or five days to prepare for a specific game.

"Time is a key factor . . . and time is one of the most valuable benefits we get from the computer," he observed.

Scouts review films of the next opponent, and submit statistics on types of plays and their effectiveness to number 6600, which generates analyses, both for offense and defense, within 24 hours.

But with most of the National Football League teams using computer analysis to determine playing trends, teams must adjust strategies in order to mask obvious tendencies.

"Computers have made football scientific in approach," observed Leach.

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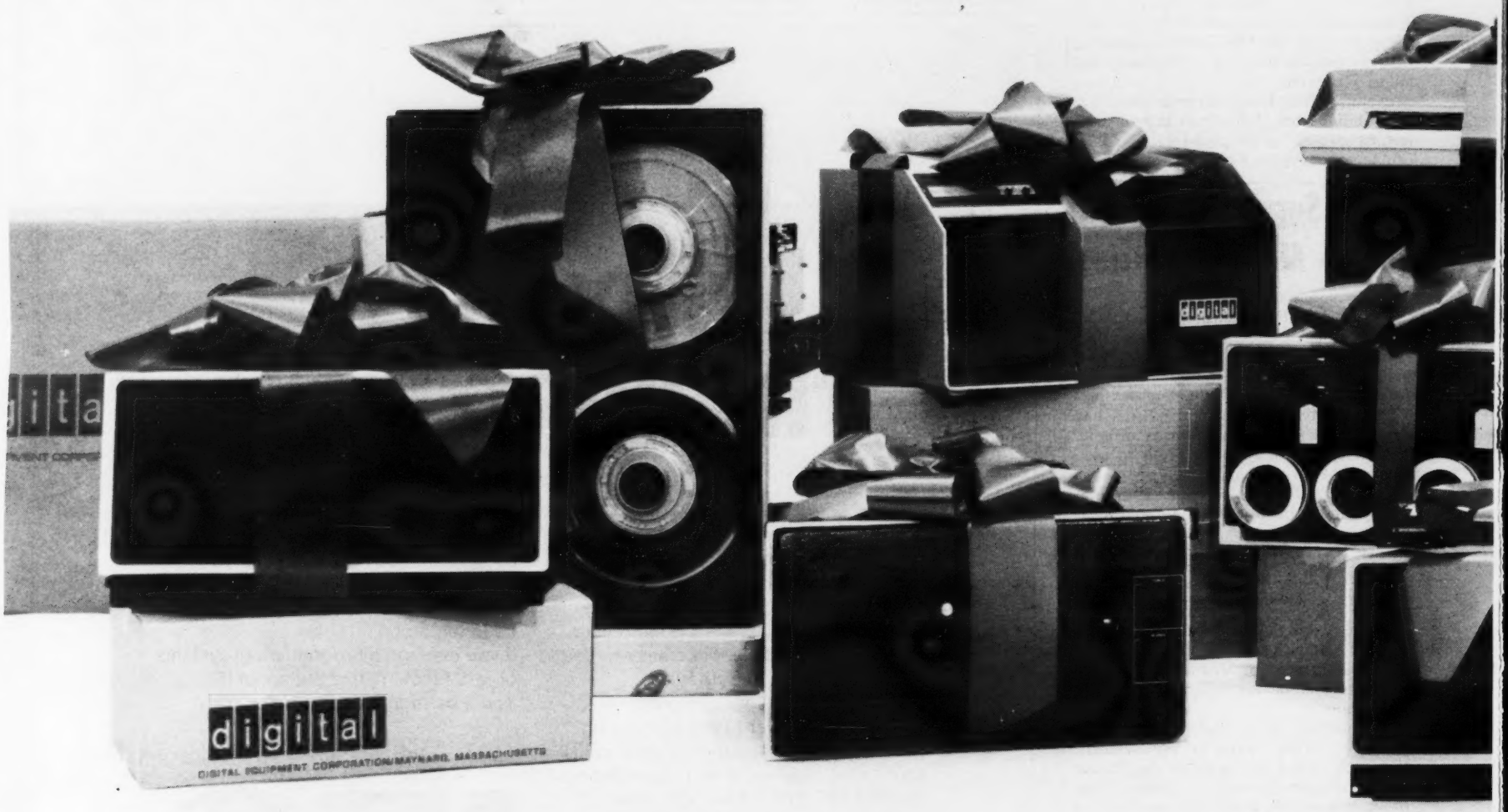

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Editorials

Users Helping Users

All computer users will be affected by the eventual settlement of the antitrust suits against IBM. And it is in the user's interest that the disputed issues be explored fully and accurately, and that any determination of the suits actually benefit the user.

But will this happen? The issues are complex. The computer industry is highly interactive. And judges and attorneys are not experts on the computer business.

There is another problem. The Justice Department is understaffed, and badly in need of assistance. It has had to hand over the job of analyzing the millions of documents in the case to a private party, Control Data. It doesn't have the economists necessary to gauge the impact of IBM on data processing, or the impact of an IBM breakup on the users. And Justice doesn't have the investigative resources to do all the necessary digging.

The DP community must help – for its own sake. Companies may be able to provide professional assistance. Organizations can do their job by representing their memberships' interests. Individual users can provide Justice with evidence, suggestions and opinions, by writing Raymond Carlson, Justice Department, Washington, D.C.

Too much is at stake to leave this war to the generals.

An Untapped Resource

The data processing community is facing personnel shortages in two critical areas – programming and data entry.

Yet, a recent project at George Washington University has proven that severely handicapped individuals who are often limited by their disabilities to working in their homes can be trained in both these professions.

And after the training, the project has shown the severely handicapped can be effective, efficient workers easily capable of competing with the more able-bodied in ability and desire to work.

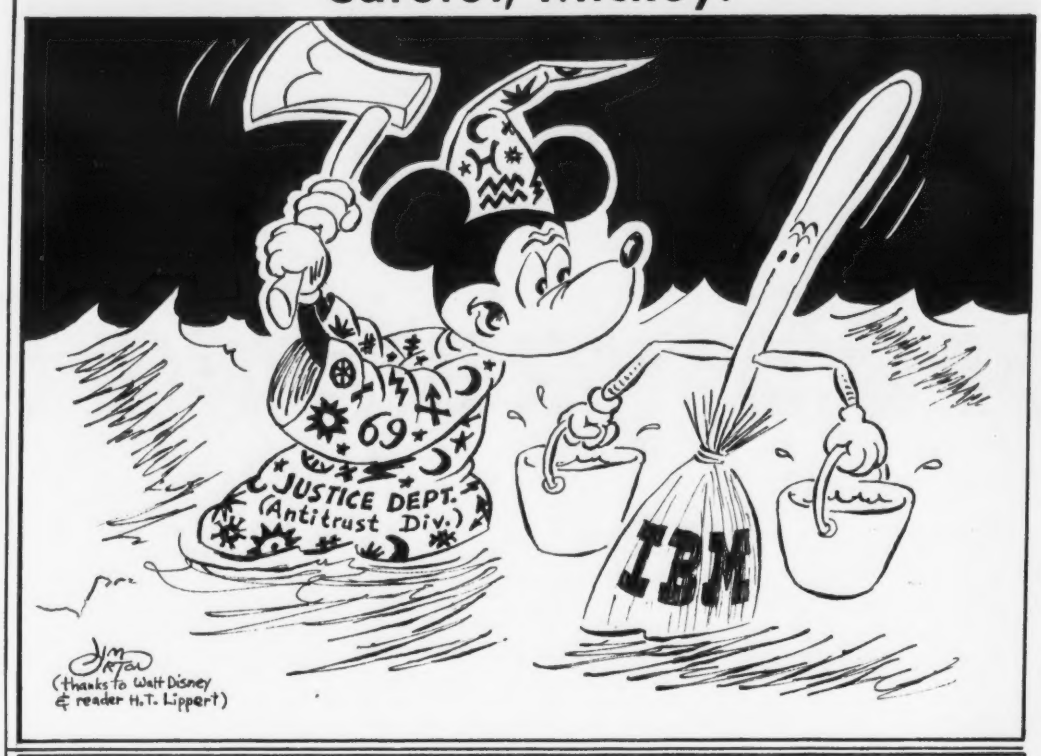
There are nearly two million handicapped individuals who fall into the category of homebound.

The DP community should not miss this opportunity to train a too often unused resource.

Both manufacturers and users can help support projects like the one at George Washington University by contributing manpower for training programs and – more importantly – employing such workers after they have been fully trained.

All society, as well as the DP community, stands to benefit.

Careful, Mickey!



Letters to the Editor

After Mickey Chops Up the Broom . . .

The case against IBM by the Justice Department [CW, Oct. 25], and in particular its proposed solution, makes interesting reading.

Could it be that Justice has never heard "The Sorcerer's Apprentice"? Can't you just see Mickey Mouse chopping up the big bad broom with his axe?

Perhaps it never saw the classic Disney rendition, but the metaphor is at least good for a belly laugh.

Henry T. Lippert
Education Specialist
San Antonio, Texas

Fighting 3 Dragons

The U.S. Justice Department's recommendation to split IBM into three or four vertical integrated companies will eliminate forever the ease of entry of any other competitor into the computer marketing field.

For companies like our own in the used computer market, this decision will be like dealing with three or four dragons rather than one.

The IBM sales offices should be turned into dealerships comparable to those of all other major capital goods suppliers of equipment to industry.

Timothy Allen
Summit Computer Corp.
Summit, N.J.

Human Factors Vital

Alan Taylor's thoughtful article in the Oct. 18 issue, "Better System Plans Can Prevent Computer Victims," illustrates too well a syndrome affecting our industry. Computer victims are the unfortunate result of the industry's unwavering (and too often unwarranted) pride in the infallibility of its innate genius and "the system's" complete reliability.

We all know that automation, rather than destroying jobs, actually creates new jobs and new career paths. To our detriment, the professionals among us have permitted too many of those new openings to become career paths to mediocrity, and the current month's balance sheet has overshadowed the fact that our industry services people.

In this age of automation, people still prefer to have a human touch in their business dealings. The human factors segment of system plans must be a heavily weighted portion of any system provided by a service industry such as ours.

Samuel W. Holland

Wrong Information

In the Oct. 18 edition, John Hunter stated that Information Science distributes the information storage and retrieval program Asap. He has that company confused with Information Associates, Inc. of Rochester, N.Y.

Richard B. Bagby
Vice-President
Information Associates, Inc.
Rochester, N.Y.

What Should Cobol Replacement Language Contain?

Viewpoint

By Joe Celko
Special to Computerworld

I am overjoyed to see two letters [CW, Oct. 25] in favor of my remarks about junking Cobol. I honestly thought that the strongest reaction I could hope for would be "yeah, but we got this pile of programs, see . . ."

Jeffrey Rupp asked for a tying together of the end of the Cobol community, but I have two objections:

- That is what is supposed to be going on with the Codasyl, Ansi, etc. committees now and from a purely political and practical viewpoint, the thing just does not work.
- From a mathematical viewpoint, the idea of a language designed by majority rule, rather than context-free grammar, is a real mess. All that a user would need to know is that one says it this way, and not that way and it compiles faster. He need not bother with parsers, etc., but he should expect that the standard designer does!

I agree there is more to getting a system set up than a good compiler sitting somewhere. But a new language would not destroy the system any more than adding an Algol or Fortran compiler to a business computer.

All it would do is give a choice to the installation: write in clumsy ugly old Cobol if you don't know any better, or use the new improved deluxe-chromed New Language.

I disagree with the idea that management cannot read anything but Cobol. The boss speaks a little algebra today, and maybe even some calculus. He knows the names of the equipment, the form of output he wants, etc. If he needs to (and most of the time he probably will not need to) read a program, he can be taught the language well enough to get through it. And there is no reason why the New Language could not be as easy to read as Cobol, or more so.

Let me grant my premise that Cobol is a dead lump and must be junked, and continue my line of reasoning. We must now look at a replacement language.

- It should have a neat syntax that can be parsed, so code can be easily generated on any machine from mini to maxi. The theory and math exist to fill this requirement.
- It should include any existing standards as regards character sets, tape blocks, punch card codes, Ascii, etc. I am not that familiar with just what these standards are, but I'm sure they exist in a well-defined form.
- It should have I/O conventions for dollar amounts. A business requirement.
- It should have a sorting sequence; or better, a way to let the user pick what he wishes to use.
- Probably a block structure, like Algol or PL/1, would be to the advantage of a small machine for paging and storage savings as well as an aid to the larger user who would want to do his programs in modules.
- Structures (trees, files, whatever you call them) would be needed as well as operators for handling them as units. Arrays would also be handled as units, as with the MAT commands in Basic, or APL devices.
- It ought to be able to write a report within the language proper rather than require a special attachment to the side.

Once you get it down, and trimmed to a nice clean language, stop. Do what the ACM did with Algol; print the report, reprint the report as needed, and let it stand, as soon as the bugs are out of the reference language.

Move to premise two; how are we going to get this new business language in use?

- Place the language in the public domain. If the standard is clear enough, compilers can be written with some of the compiler compilers we have now.
- Push it a little. Exactly what that means is a little vague right now. But figure on doing a publication for wide distribution in the trade that would have the format end of the language and a good pop discussion with some samples – a tabloid newspaper, mailed to everyone and his brother maybe?
- Put down Cobol. I dislike the idea of a negative approach to selling an idea on principle. But without a strong comparison between Cobol and the New Language that keeps showing that Cobol is the weaker product, you would have a tough time getting people to switch.
- Develop compilers for as wide a range of machines as possible and make them available to users. Cheap.
- Get Uncle Sam and the big boys to at least accept the New Language as an alternate in bidding. Write your congressman, start a lobby, etc.

Joe Celko resides in Atlanta, Ga., 30310, where he can be reached through Box 11023.

Scheduling System Did Less Work, Had Better Results

The Taylor Report
By
Alan Taylor, CDP

Until this year a group of schools in New England used computer methods to schedule classes and assign students to specific classrooms.

Input for this technique consisted of a list of all student requests for courses, descriptions of available classrooms, details of the teaching loads members of the faculty were expected to undertake, and a "best guess" from the administration as to what the final schedule would look like.

Working with this material, the computer would produce lists and notices that told "Jimmy to go to classroom 105 at 2:30 on Thursday afternoons and take French."

In short, the computer application was a type of dictatorship. The computer said "go" – and Jimmy went.

Of course, while dictatorship systems are simple, there are drawbacks. One is that the dictator is blamed for everything that appears to have gone wrong, but is rarely given the credit for the many things that go right

Like all dictators, therefore, the computer received more blame than was perhaps justified – and less praise for its effective operations.

This year was different, however. In May the same information as usual was given to the computer. The same programs were used, but they were stopped before they started allocating students to particular classrooms. They were stopped when a workable schedule of classes had been designed.

At this point two new sets of output were produced – a list of every course each student wanted to take, and a "course seat available" card for every seat in each of the courses the school was offering.

The computer had to do some very constructive work to produce the second set of cards. It had to resolve the problems of lunch hours, match elective times and arrange classrooms according to the wishes of the students. The program had worked out the best schedule for the school and the faculty which also met the requirements of the school administration and the wishes of the students.

At this point it would have been quite simple to proceed in the dictatorial way – and start assigning Jimmy some specific course schedule.

This was not done, however.

Instead, one day in early June, Jimmy was given the list of all course times, a tentative list of the courses he had selected. Next day, he went into a room where each faculty area was displaying each available course.

The French faculty had a table, showing that French for Jimmy's grade was available on Thursdays at 2:30 in classroom 105 – and also on Wednesday at 9:00 a.m. in classroom 502. Other departments had similar setups.

Jimmy was there because he, not the computer, was making the decisions as to where and when he would study.

Jimmy made his decisions by going to the tables in turn, and picking up a course seat available card for the particular course of his choice.

If there was any difficulty – if a faculty member thought Jimmy should not take that course, or if there were no further seats available for the course – then Jimmy had plenty of alternatives.

He could appeal to other faculty members against the idea that he was not ready to take the course. He could rearrange his thinking, and take a course later in the year – or at a different time. He could swap courses with his friends or arrange to take courses which he saw were available and that didn't conflict.

In short, for the first time he really chose his courses. He chose them because the scheduling method the school was using – called Arena scheduling in honor of the mad scramble that can occur – used the computer as a tool rather than a weapon. Arena scheduling built itself and its success on cooperation rather than on pure dictatorial power.

For the student, in many real and important ways, 1972 marked the time when he took over the decision-making task from the school faculty, after a transitional reign by the computer had permitted the skills of the computer analysts and programmers to relate the students' desires to the realities of facilities and faculties.

That is quite a change. It is, indeed, a major advance for computer applications.

The students liked it. They found they were able to use their newly available decision-making power effectively.

One student has a job on Wednesdays, Thursdays and Fridays. He arranged his schedule to give him time to get through the traffic – even during the New England snows.

Another student is having trouble with Math, and finds he is more alert in the morning. So he scheduled his Math classes as early as he could, and now he is making better grades.

Another student does not wake up until after lunch, so his troublesome math classes are in the afternoon.

And so it goes on. Arena scheduling is a success for the people who make the decisions – the students.

Other changes – some expected – were noticed in the schools that tried the experiment.

The main expected effect was the information provided by the way students selected their courses. Information was provided on a number of matters – from student opinions of their schoolmates, to their wishes regarding free time.

Student choices acted in part as a barometer of opinions of the faculty members. The students, to quote one principal, "voted with their feet" – and their votes could be counted by seeing whose classes were booked up quickly, and whose were taken reluctantly.

In some schools this faculty opinion information was not available. At the time of the scheduling faculty names were not revealed to the students for one reason or another. But where the faculty names were available, the school authorities did get valuable input.

Not enough, of course, to say that one teacher was not doing his job as well as a more popular teacher. But enough for the principal or the department chairman to say, "we seem to have a problem – so let's discuss the matter together."

That is quite an advance from having to rely upon the occasional complaints a few students or their parents bring into the school office or to the PTA.

The major unexpected change occurred in the parents' reaction to the process. No one had expected any reaction – but there was a big reaction.

Reaction came in schools that were liberal in educational philosophy, and which believed in experimenting because the community believed in experimenting.

But, it also came from conservative communities where the only reaction expected was an objection to the change.

The reaction was not an objection to the Arena scheduling – in fact, no one seemed to be interested in the method. What interested the parents more than ever before was their children and their children's education!

The school offices reported at least a 200% jump in parent interest. Parents came in to talk to the staff. They changed the courses their children had chosen and persuaded them to rethink their goals. They reacted to the free-time arrangements with family arrangements.

The parents were, in short, brought into a stronger partnership with both school and student alike.

This change certainly was unexpected. It may be unimportant – because as yet we do not know if the same interest surge will occur next year.

The year 1972 certainly marked one great transition in the use of computers – the time when the computer was promoted from being a dictator to becoming a facility. More important, 1973 may confirm that the computer can improve the partnerships among men.

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IBM Data Entry System

U.S. Users Deprived of Needed Product

By E. Drake Lundell Jr.
Of the CW Staff

IBM's decision to enter the key-to-disk data-entry market only in Europe [CW, Oct. 4] is undeniably depriving many U.S. users of a product they need and could apply effectively.

The action, for whatever reason, is indefensible.

If the technology is a true advance, as IBM told its European customers, then it should be available here as well as overseas. If it is not, then it should not be foisted on any users, whether domestic or foreign.

The 3740 system, in its present configuration, with only two keystations maximum communicating to a "floppy disk," is definitely not a major competitor to the large shared-processor systems offered by several U.S. manufacturers.

Because of its large user base and exceptional user loyalty, IBM more often than not sets the standards for the industry. Many users are unwilling to buy a product unless it is made by IBM and many others will not buy an independent product unless IBM makes a similar piece of equipment.

Because of this it is likely that the IBM floppy disk will set some sort of a new standard for low-level data-entry applications, someday.

But U.S. users cannot have it, and U.S. manufacturers will have a difficult time producing a compatible floppy disk unless they can get their hands on some of the ones sold in Europe.

How many users will now want to buy a data-entry system – even if they have a crying pre-

Viewpoint

sent need – that may be made obsolete or at least incompatible when and if IBM decides to bring the new disk system to the U.S.?

If IBM delays the move indefinitely, many users will put off improving this part of their operation, even though there is a definite need for such improvement – with data-entry operations costing the user at least 30% of his budget.

The most common explanation heard today – and probably the one closest to the truth – is that IBM does not want to impact its large keypunch base in the U.S., which keeps on producing revenues and profits for the firm at such a phenomenal rate that it has been called a license to mint money.

But there may be two more reasons for the move, both of them equally culpable. First, there seems to be some apathy on the issue and secondly IBM may feel the European user is not as sophisticated as his U.S. counterpart.

IBM has told users for years it did not really plan to get into the shared-processor market, because it felt direct data entry via CRT terminals would be the major method of data entry in the future when prices for such units become economical.

Users Haven't Pressed

Since then, it appears that U.S. users have accepted that explanation and have not pressed hard for the shared-processor concept from IBM.

IBM may also have felt it could not compete with the shared-processor systems offered by others in the U.S., but possibly the Europeans would accept the IBM product over that of its competitors.

This may be true to an extent: Surveys and studies have found the European user is less willing than his U.S. counterpart to take risks with outside suppliers, and therefore less likely to choose non-IBM gear when IBM offers a similar product.

But no matter what the reason for the IBM move, it is clear that U.S. users are being deprived of a product they need now.

This situation should not be tolerated by any users, anywhere.

Letters to the Editor

Used 360 Market Not in Danger

The article "Used Computer Market Could Collapse if Lessors Sell" [CW, Oct. 18] is extremely misleading and potentially injurious to a relatively new, growing and important part of the computer marketplace.

You cite International Data Corp., which owns *Computerworld*, as the source of information to the effect that the used computer market could "completely collapse" if large 360 leasing organizations decide to dump their inventory, etc.

The System 360 lessors have book values for their inventory of computer systems so far above the current used System 360 market prices, that they would need to take the most colossal book loss any small industry has ever taken in order to "dump their inventory of equipment on the market."

On top of this, the market could and would absorb all of the System 360 equipment in the 360 lessor's portfolio since practically all of that equipment is currently employed and in use. Only a significant change in the ownership of System 360s would take place, not a used computer market collapse.

Joseph A. Blitt
Summit Computer Corp.
Summit, N.J.

Transmission Abroad Underestimated

I have read the "Foreign Communications Still Limited" article [CW, Oct. 4] and although I do not know the particulars of the ADL study I feel the actual status of data transmission in Europe was underestimated.

In Spain, in addition to the lease of private circuits up to 4,800 bit/sec and the use of the switched telephone network for data transmission we have in operation a special network of the store-and-forward type mainly for real-time users.

F. Mozo Garcia
Director
Data Transmission Service
Compania Telefonica
Nacional de Espana
Madrid, Spain

Across the Oklahoma Fields...

There is plenty of space for several students (left) working on separate problems in the mobile laboratory, housed in a trailer (above) that is towed from campus to campus during the school year.

. . . a Graphics Lab on Wheels

OKLAHOMA CITY, Okla. – Vocational students throughout the state will get direct "hands-on" experience with computer-based graphics equipment at minimum cost to the school systems, through the use of a mobile laboratory sponsored by the state Department of Vocational and Technical Education.

Housed in a mobile home shell, the unit is similar in concept to one set up last year in Green Bay, Wis., which provides that city's four high schools with hard-

Education

ware for DP courses, without having the students come to a central site or each school provide its own facilities.

The Oklahoma laboratory is built around an 8K IBM 1130 with a 50 line/min printer, card reader and UCC 200 plotter. The software is said to be problem-oriented so that students without prior DP experience will be able to use the equipment to solve their technical drafting problems.

Students can sketch drawings on simple graph paper layout forms and convert the drawings to coordinates which are recorded on punched cards. Used as input, this data generates the finished plot, traveling instructor Tom Thomas explained.

The unit is "self-contained" and includes classroom facilities in addition to the computer. In that way, there are no special scheduling problems for the schools the laboratory visits, he said.

The mobile laboratory started its tour of the state at Northeastern Oklahoma A&M College in Miami and has been at Oklahoma State Tech for three weeks. Before finishing the year at Stillwater in May, it is expected to visit colleges in Tulsa, Warner, Wilburton and Tishomingo.

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Random Notes

Period for Cobol Comments Extended to February 13

WASHINGTON, D.C. – The comment period on the proposed revision of ANS Cobol has been extended to Feb. 13, 1973, according to X3J4 committee chairman Robert Kearney. The draft is now available but delays in printing made the extension necessary, Kearney explained.

Technical comments should be sent to Kearney at Bell Labs, BISP area, Room 4D819, New Brunswick, N.J. 08903.

Requests for the $6 draft, and comments of a non-technical nature should be sent to the X3 Secretariat at Bema, 1828 L St., N.W., 20036, Kearney added.

TAG-11 Operating System Speeds PDP-11 Throughput

BERKELEY, Calif. – PDP-11 users who have been operating under DEC'S DOS-11 can drive their systems faster, or use less core for systems functions with the TAG-11 operating system from Data System Design (DSD).

Developed by The Applications Group, Davis, Calif., TAG-11 is said to run anywhere from two to five times faster than DOS-11 in the same amount of core needed by the DEC software, or to operate at the same level of efficiency as the DEC support in 8K of core, rather than the 12K required by DOS-11.

DSD is at 1122 University Ave., 94702.

R&R Controls Contributions

RIDGEWOOD, N.J. – Charitable organizations can process contributions, orders, subscriptions and expense items, and retrieve mailing lists and statistical data, with the Revenue and Retrieval (R&R) package from Computer Covenant Corp., 1156 E. Ridgewood Ave., 07451.

R&R's capabilities are generally similar to those needed by many businesses, but the output is particularly useful to charities, a spokesman said. The Cobol package runs on a 128K 360, with two 2314 disk spindles and four tapes, under DOS. It sells for $10,000, leases for $400/mo.

Mini Gets Cogo Capability

MAYNARD, Mass. – Architects and civil engineers can solve land survey, traverse adjustment, horizontal alignment and vertical curve problems on a PDP-8/E, with the coordinate geometry software package, Cogo-8, from DEC.

Developed at MIT, Cogo allows the user to express his problem in his own terms. A turnkey Cogo-8 package, including a 16K PDP-8/E, two Dectape drives, a 30 char./sec terminal, Fortran IV and OS/8 will be available in January for $20,800.

The Cogo-8 software by itself is available for $1,500. OS/8 and Fortran IV, which are needed to use Cogo-8, cost an additional $1,000.

User Comments Wanted

CSA Proposes Standard Program Design

By Don Leavitt
Of the CW Staff

TORONTO, Ontario – The Canadian Standards Association (CSA) is seeking user comments on a proposed "standard on program design" intended to provide a logical framework for many application programs.

The procedures are language-, machine- and implementation-independent, CSA said. They are general enough to cover any application that uses sequential, sorted input files and that requires some action when a change occurs in a variable defined in a control field.

Reading Order

The standard is said to help the user determine the order in which the input files are read, the variables that belong in the control field, the general logic of the program's mainline, and the type of processing that should be done in each section of the mainline.

The standard notes there are "always" five sections to a simple mainline program, but then adds that these sections may be non-existent, "depending on the problem at hand." Initialization includes all the "once per run" housekeeping chores.

The Get Current Control Field section manages the acquisition and testing of records from the files to determine which should be used next. This includes the rolling of the control field as each new record is chosen, to allow testing of the variables in the control field.

Ascending Sequence

The standard, as drafted, is designed only to work with sequential files, sorted in ascending order, but there is nothing to indicate why the high-low logic could not be reversed if the user wished to maintain files in descending sequence. Indexed sequential (Isam) and direct access files apparently cannot be managed by the logic of the standard.

The summary section handles logic to determine when control fields have changed, the sequence in which they should be tested and what to do when they do change. There is no limit to the number of control levels available under this standard.

The reinitialization portion of the main-line supports the clearing of control total accumulators after they have been used (at a change of the appropriate variable), so they will be available for the buildup of the next subtotal.

The normal processing section of the mainline works with the individual record once all the processing triggered by changes has been completed. After this, the logic returns to the Get Current Control Field Section.

Philosophically Useful

Though many users can appreciate what the standard is attempting to do, one industry observer suggested the result is more useful philosophically than practically. Users, he noted, still have to fill in all the coding to make the system work.

No time limit has been set for user comment but CSA spokesmen indicated they would like reactions as soon as possible.

Copies of the draft standard are available from CSA at 178 Rexdale Blvd.

$40 Buys Government-Developed Report Generator/File Manager

BERKELEY, Calif. – Users tempted to try report generator/file management software but frustrated by the cost of most commercially available systems may be able to solve their dilemmas by paying $40 for the Syntax language system, developed and now being distributed by the California State Department of Public Health.

Designed for use on 360/370 and Univac Series 70 equipment, the program is a one-pass compiler that continues through job execution unless statement errors are encountered. Syntax may be used in batch-processing mode or, on the Univac configurations, entered at a terminal.

Several Input Files Read

The free-format statements, utilizing a system of key-word parameters, enable the user to read one or more input files. These may be either tape or disk-based, but the system is not sophisticated enough to work with Index Sequential file organizations, a state spokesman noted.

The data can be reformatted and accumulated to generate user-defined reports or statistical summaries of the input files, or to create one or more output files.

Logical operators allow the use of Boolean algebra to identify clusters of records or to determine interrelationships between records. A full range of mathematical operators supports calculations as complex as the user needs, the spokesman said.

Written in BAL

The Syntax compiler is written in BAL to enhance its core utilization and processing speed. The full package requires a minimum of 55K bytes of storage, exclusive of operating system, so it will not fit in a 65K configuration.

An earlier version, essentially a subset of the full Syntax, will function within that size machine.

The $40 price includes the object program on magnetic tape, and a user's manual. Extra user manuals are $5 each.

The California State Department of Public Health DP Center is at 2151 Berkeley Way, 94704.

Modular System Aids Merchants In Handling Credit Card Sales

OMAHA, Neb. – Credit card associations or any merchandising groups that require immediate interaction between sales stations and centralized authorization staffs should be able to use all or part of the credit card processing system from First Data Resources Inc. (FDR).

The system includes modules in support of on-line CRT data entry, on-line credit authorization and alpha lookups for inquiries.

While the modules can be used in stand-alone mode, they have been designed to work together to form an integrated total system. A CRT operator may be entering data from sales slips, for example, when she is interrupted by an incoming telephone authorization request.

She may handle that call, including the accessing at her screen of the customer's record, and then return to her data entry job right where she left off, even if she was in the middle of a batch, FDR said.

The alpha lookup component provides the operator with an alternative means of access in case the customer's credit card or charge account number is not available.

The lookup is said to be forgiving enough to accept approximate spellings as entry keys. Thus telephone inquiries, when the sound of the name is garbled, can be handled without asking the customer to repeat his name several times.

Except for the on-line portion, the system is written in ANS Cobol. It will operate within 128K on a 360/370, and was originally available only for OS but is now being adapted to a DOS environment.

Purchase price of the system is in the $100,000 range but can vary either way depending on the amount of assistance required from FDR for modifications and installation.

FDR is at 7301 Pacific St., 68114.

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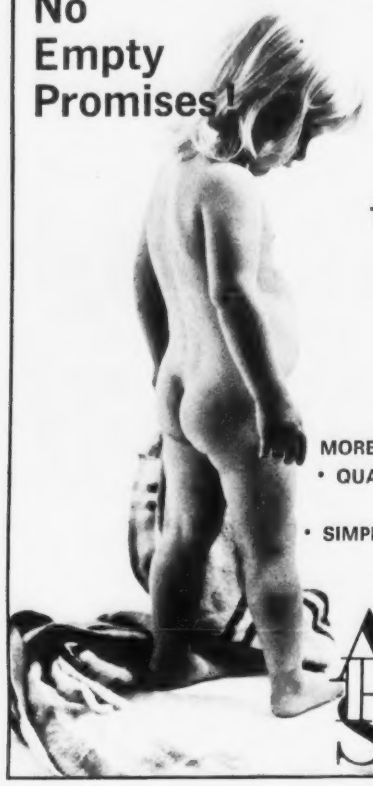

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Dartmouth Time-Sharing Control System Packaged for Other H635/6000 Sites

HANOVER, N.H. – The operating system that drives the Dartmouth (College) Time-Sharing System and allows hundreds of jobs to be handled concurrently can now be installed on in-house Honeywell H635 and H6000 series CPUs.

The application programs in the system's "public library" have been available from the college's Kiewit Computation Center for some time, but the control software now has been packaged by the newly formed DTSS Inc. for use on other installations.

The Dartmouth operating system is said to gain its efficiency in handling both batch and interactive jobs by "turning inside out" the approach followed by other software controllers. Rather than treating time-sharing jobs as tasks that interrupt batch work, the DTSS package considers batch jobs as time-sharing tasks.

The result, he said, is a system similar in power to the newly announced Mark III service on GE's commercial time-sharing network.

The similarity is not surprising, of course, since GE's introduction to the problems of time-sharing was closely linked with the birth pains of DTSS, and both DTSS and Mark III are essentially based on standard Gecos operating system software.

The system is a real workhorse, suitable only for those users with heavy concurrent-user demands. Dartmouth regularly has more than 130 users on its implementation, working in Basic, Fortran and Cobol.

It can be installed successfully at H635 sites but DTSS Inc. described "small," "medium" and "large" configurations, to support 40, 124 or 248 lines, in terms of H6000 mainframes.

One possibly disquieting point, the spokesman admitted, is the fact that the system utilizes rather old-fashioned Datanet 30s to handle communications.

To support 40 users requires a single Datanet 30, and a 96K-character H6030 CPU including a DSS-180 disk controller and five active drives.

Expanding the system to reach 124 users forces a hardware upgrade to a dual H6050 configuration with a total of 120K characters of storage, and a dual-channel DSS-180, using all nine drives. Two Datanet 30s are needed for the "medium"-sized system.

Dual H2070s with 256K-character main storage and two "cross-barred" DSS-190 controllers supporting two billion characters of disk storage allow up to 248 concurrent users, feeding through four Datanet 30s, DTSS Inc. said.

Cost of the DTSS operating system ranges upwards from "around $25,000/mo to $30,000/mo," while the hardware not supplied by the new company is estimated to lease for $27,000/mo on the "small" system to $100,00/mo for the dual H6070.

DTSS Inc., a taxable corporation owned by the trustees of Dartmouth College, can be reached through P.O. Box 799, 03755.

Service Allows Interactive Edits Before Batch Work on Network

ARLINGTON, Mass. – Subscribers to PHI Computer Services' remote-computing network can interactively edit data files or modify programs before submitting work for normal batch-mode processing, with the Wylbur conversational remote-processing service.

Referencing only user-selected portions of data files, source programs and newly entered input data, transferred to a direct-access device for optimum availability, Wylbur holds a dialog with the user until all the data has been handled.

Minimum Core

Wylbur editing routines use a minimum amount of core on the PHI 360/65 and therefore minimize the normal time-sharing overhead cost of swapping different users' jobs in and out of memory. This not only speeds each user's work but keeps his costs down at the same time, PHI said.

Developed at Stanford University and modified by PHI before being installed on the network, Wylbur is functionally similar to IBM's Conversational Remote Job Entry (CRJE) or Applied Data Research's Roscoe package.

Wylbur can be accessed from individual teletypewriter or CRT-type terminals, or by a number of these devices clustered around a single high-speed remote print station.

In addition to reviewing data files and program logic prior to an execution, Wylbur allows modification of stored copy prior to a text-editing run or access of virtually any part of the OS catalog for review.

PHI's service including Wylbur is available throughout New England and New York State, a company spokesman noted from 800 Massachusetts Ave., 02174.

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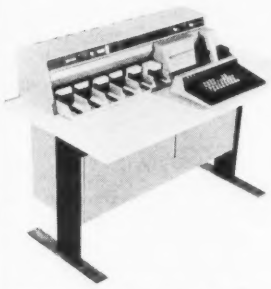

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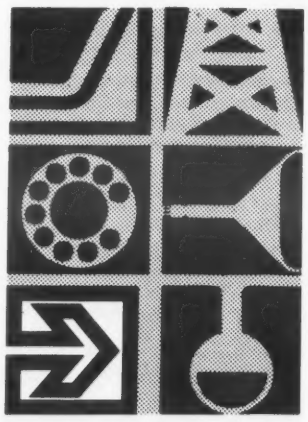

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COMMUNICATIONS

Data Briefs

Modem Selection Criteria Outlined in Guide for Users

DEDHAM, Mass. – Users who select the wrong modem for their network usually were unable to evaluate the technical claims made by vendors and/or common carriers.

This is one of the findings in a guide to modem selection and evaluation published by Artech House and written by Vess V. Vilips. Because of advanced technology, many independent modems offer "more operational and self-test features" than those supplied by the telephone companies, the guide said.

The guide takes users on a typical evaluation sequence that should be performed when new data sets are being considered. Included are discussions on the proper transmission speed, correct phone line to handle the user's application and a description of fault-isolation methods.

Intertel Has Two Modems

BURLINGTON, Mass. – Intertel Inc. has introduced two modems which are Bell 202C-compatible and can operate at 1,200 bit/sec over dial-up lines.

The 2020 is comparable to the Bell 202C5 and costs $330, while the 2021 includes a 5 bit/sec reverse channel and is similar to the Bell 202C6. The 2021 is priced at $440. Both models operate with the Bell CBS or CDT data access arrangements.

Each modem is built on a single circuit card and can be installed in a variety of enclosures. Intertel is at 6 Vine Brook Park, 01803.

Voice Response Handles Data

MOORESTOWN, N.J. – Applied Information Industries has a system which combines voice response and communications control. Called the VSC-2000, it replaces the IBM 7770 voice response and IBM 270x line controller on both 360 and 370 systems, according to the firm.

As a communications controller the system handles CRT and hard-copy terminals. The system uses Touch-Tone telephones for voice access and Bell 103.202 modems for data access. Prices start at $50,000. The firm is at 345 New Albany Road, 08057.

Singer Adds Register/Terminals

SAN LEANDRO, Calif. – Two combination cash register/remote terminals are available from Singer Co.

The 908 electronic cash register costs $3,400. Data communications capability can be added through field modification for about $300.

The 928 incorporates a side insertion printer for printing sales checks and cash receipts and provides an original record of each transaction. Sale price is $3,550, and modification for communications is about $300.

User Saves $40/mo

Model 38 TTY Replaces IBM 2740s

By Ronald A. Frank
of the CW Staff

EUGENE, Ore. – One of the early users of the Model 38 Teletype is using the terminal to replace IBM 2740s and is saving $40/mo per terminal in the bargain.

The Oregon Total Information System (Otis) is a cooperative non-profit organization serving 48 school districts within the state, some as far as 250 miles away.

The Model 38s operate as part of a multiplexing service provided by Pacific Northwest Bell, according to Robert Dusenberry, the Otis director. The user said he pays $71/mo to the telephone company for the Model 38s which operate at 150 bit/sec.

Same Vendor

The TTYs are used in the business offices of the schools served by Otis. One advantage of the TTYs over the 2740s is that the equipment "is all coming from the same vendor," Dusenberry said. "The phone company owns the terminals and the lines so we don't get into sessions about whose equipment is causing problems," he added.

While he would not say he expected better service from the phone company than he gets from IBM, Dusenberry said two vendors "can create problems in testing and coordination" for the user.

The Model 38s are linked to a 360/50 and are used primarily for administrative applications. The Otis network includes 119 remote terminals of various types, Dusenberry added. This includes 35 Model 38s, Hazeltine CRTs, Model 33 TTYs and some IBM 2740s.

In addition to the Model 50, the network provides subscribers with a Hewlett-Packard 2000 CPU, for non-business applications.

Terminals in the Otis network can be connected to either CPU, depending on the job, Dusenberry said. The terminals can be switched to the correct processor by a Tempo 270T front end, at the user's request, he added.

"We provide all services including payroll, financial, inventory, personnel, cafeteria accounting, student services, mark reporting and others, Dusenberry said. "We provide all the DP services needed by schools," he added.

The multiplexing service from Pacific Northwest provides six data channels on each voice-grade line at a cost of about $50/mo per terminal, Dusenberry said.

Although he saves money by replacing the 2740s, the IBM terminal is a "little faster and has a tab capability" which the Model 38 does not have, Dusenberry said. On the other hand, the 38s have a batching capability with a paper tape feature not available with the 2740, he said.

The smaller schools can afford the Otis services because a terminal can be used for all applications, Dusenberry said. The same terminal can be used for business, student and instructional services, he said.

Another user of the Model 38 is a business firm in New Jersey that is leasing its TTY from RCA Service Co. The firm is using the Model 38 on the GE time-sharing network and pays $85/mo or about "$10/mo more than the Model 33."

Among the advantages of the 38 over the Model 33, according to this user, are its wider platen to accommodate a full CPU printout line and its quieter operation.

The Model 38 can print the full Ascii character set, both upper- and lower-case characters, and also prints red or black characters, the user said.

Interconnection Impacts Users' Communications Network Plans

By Ronald A. Frank
of the CW Staff

NEW ORLEANS – With interconnection a current data communications topic, *Computerworld* asked users at the recent Digitronics Users Association meeting here how this issue affects them.

Dickey

Polvino

CW Photos by Ronald A. Frank

Larry Dickey, manager of corporate methods and procedures, Walgreen Co., – "Interconnection directly concerns us. We are looking at independent point-of-sale equipment which will be connected to the phone network within three to five years."

Charles Polvino, project leader teleprocessing systems, American Cyanamid Co. – "There is always a feeling of being safe and secure with an established carrier's equipment. But the savings with equipment from the independent vendors are so great that the user absolutely has to take the risk."

Jim Rooney, EDP operations and service manager, Massey Ferguson Inc. – "Bell always proposes something that is three years away. By the time it is available my needs have changed. So we depend on the independent 'Rube Goldberg approach' to get what we need."

CW Inquiring Photographer

Bob Regner, DP manager, League Accounting Center, Iowa Credit Union League – "There is increasing pressure from the small user to get an easier way to interconnect equipment. Within five years our credit unions will have to communicate on-line. By then interconnection will be a lot easier than it is now."

Rooney

Regner

AT&T Files DDS Plans With FCC

NEW YORK – AT&T has filed an application with the Federal Communications Commission to provide its Digital Data Service (DDS) to the first five cities in its proposed network [CW, Aug. 30].

Each city would be served by a 1.544 Mbit/sec "Digital Channel Group" using Bell's Data Under Voice (DUV) technology, according to the application. Initial service, if approved by the FCC, will be provided to Boston, New York, Washington, D.C., Philadelphia and Chicago beginning in January 1974, AT&T said.

Four types of service offerings will be included. Type 3024 facilities will operate at 2,400 bit/sec; Type 3048 lines will operate at 4,800 bit/sec; Type 3096 circuits at 9,600 bit/sec; and Type 3560 facilities at 56K bit/sec, according to the application.

"Illustrative rates" for the service range from $20/mo to $300/mo depending on speed plus a mileage charge ranging from $0.45 to $4.50 per airline mile per month. Analog-to-digital connection charges and service terminals would incur additional charges for the user.

"Analog signals cannot be transmitted" over the proposed all-digital service, the application said.

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Until now, many computer peripheral manufacturers have chosen not to meet "the number one" in direct battle. Some opted for specialized equipment, which IBM didn't offer . . . others, for lower prices on equipment which was essentially a carbon copy of a dated IBM original . . . or sell-it-and-forget-it arrangements, dependent on somebody else's service organization.

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*Source: International Data Corp. (IDC), an independent computer industry research firm.

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Point-of-Sale System Success Linked To Other Applications, Nerem Told

By a CW Staff Writer

BOSTON – Most users of point-of-sale (POS) terminal systems have not adequately assessed the true value of their systems. And as a result, terminal usage must often be spread to other applications to make the system profitable, according to D.C. Leonard of TRW Systems.

Speaking at the 26th annual Northeast Electronics Research and Engineering Meeting (Nerem) here, Leonard said in the past the cost per transaction for a POS system has been about $1. This has now been reduced to about 50 cent/transaction, but it will have to drop to about 5 cent/transaction to make these systems cost effective, he said.

One of the problems in operating a POS system is that current telephone data tariffs are not "responsive" to the needs of networks with widely dispersed low utilization terminals, Leonard said.

For some typical POS systems total system development costs exlusive of special hardware are 10 to 20 times the total monthly operating costs of the system. And because of the "peak hour" characteristics of these systems, network utilization will always be far less than the optimum design factor, he said.

But despite the drawbacks, Leonard noted service companies offering "economical shared telecommunications and processing services to smaller users" will help resolve the POS cost/value conflict.

Design Criteria

In describing the operating characteristics of the Xerox Telenet system, P.L. Arst said roughly one half of the system costs are allocated to line charges, one-third to modems and terminals and one-sixth to the CPU, operations and support personnel.

While line costs have remained relatively stable, hardware costs have dropped rapidly and can be expected to continue in this direction, he said. Therefore a data communications system with high initial line costs is a candidate for "future cost reductions through the use of distributed hardware such as minicomputer concentrators and terminal buffers," he said.

About 20% of the design effort in a data communications network should be involved with "normal conditions" while 80% should be devoted to "error conditions" that may occur, he said.

Satellite Transmissions May Hold Key For National Police Fingerprint Network

SACRAMENTO, Calif. – Orbiting satellites will probably be used some day to transmit fingerprint images between criminal justice agencies. When that day arrives, a minor addition to the communications system could be digital data transmission, thus relieving landlines of this burden, according to a technical report on a 1971 fingerprint transmission experiment.

The experiment was conducted for Project Search by the California Crime Technological Research Foundation, and it included transmission among sites in Los Angeles, Sacramento and Tallahassee, Fla. The ATS-1 satellite of the National Aeronautics and Space Administration was the relay medium.

Technically Feasible

A primary conclusion reached, according to Project Search, was that a national satellite-based communications system for the high-speed transmission of fingerprint images, other documents and "various other data" is technically feasible and "best satisfies the requirements of law enforcement agencies."

The report on the experiment also concluded that computer-to-computer links already in operation through landlines could be accommodated with document transmission capability because digital data has "relatively low bandwidth requirements."

If a wideband system is to be established to transmit fingerprint images, it is "reasonable" to consider simultaneously carrying the digital data transmission needs, the report explained, because the lesser bandwidth required for digital data is a "fairly low-cost addition to any wideband transmission system."

A computer interface link is already carried by satellite between Honolulu and the California Highway Patrol, the report noted.

Nova Multiplexer Handles Up To 128 Additional Ports

NEWPORT BEACH, Calif. – An 8-channel multiplexer on a plug-in circuit board has been developed by Educational Data Systems for users of the Data General Nova.

Designated the EDS-8, the unit occupies one card slot in the mini's chassis and can be expanded to handle up to 128 ports by the use of additional circuit cards, the firm said.

The data rate for each port is individually selectable under program control from 110 to 9,600 bit/sec, and any combination of TTYs, CRTs, other terminals and modems can be handled.

The multiplexer can serve as a "communications preprocessor" in a time-sharing application and program drivers are available to interface the unit to the firm's time-sharing operating system. Up to eight serial asynchronous devices operating in simplex, half-duplex, full-duplex mode can be handled by the multiplexer.

Each port on the multiplexer has its own input and output buffers providing either full- or half-duplex operation. The unit operates directly through the Nova's DMA channel. The EDS-8 costs $3,500 and a 128-port system is priced at about $120/port, the firm said. The company is at 2415 Windward Lane, 92660.

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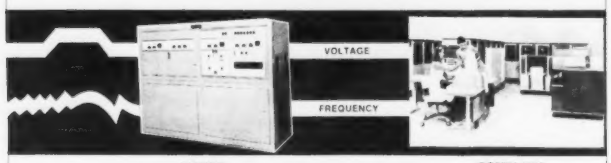

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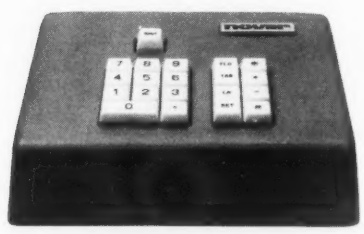

The Novar 5-02 Ten-Key Numeric Input can be added, at any time, to a Novar tape communication terminal or the Automatic Tape Typewriter, enabling them to handle bookkeeping, accounting, engineering and scientific data entry functions. The 5-02 utilizes the terminal's or typewriter's buffer, printer and tape recorder. And the 5-02 rents for just $15 a month.

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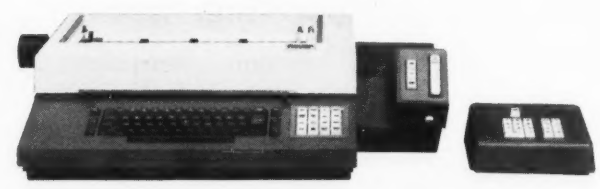

The Novar 5-50 and 5-60 communication terminals, and the 5-30 Automatic Tape Typewriter, have a built-in connector to which a number of auxiliary devices can be attached. One of these is the 5-02 Ten-Key Numeric Input which adds the capability to handle a wide range of numeric data, at a fraction of the cost of a separate system that performs the same functions.

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Bits & Pieces

155, 165 Users Can Have Up to 4M Bytes of Memory

SAN FRANCISCO – Users of the 370/155 and 165 can increase real memory beyond IBM-designed limits with semiconductor main memory extensions from Itel Corp.

The Itel memories allow both the 155 and 165 to be expanded to 4M bytes – IBM's limit is 3M bytes for the 165 and 2M bytes for the 155.

The larger memory options are offered as an alternative to upgrading to "virtual memory" machines.

Purchase price of 4M bytes of semiconductor memory is $1,584,000 with a two-year lease of $43,200/mo. and a five-year lease of $36,000/mo.

Delivery of the first units is set for April 1973 from One Embarcadero Center, 94111.

600 Line/Min Miniprinter Offered

DARIEN, Conn. – The DAC 600 DP, a minicomputer print system offered by Digital Associates Corp., includes printer interface, connectors, interconnecting cabling and a 600 line/min., 132-column printer.

It can also control other devices such as adding machines through self-generating output signals from the keyboard. All control functions can be actuated from the keyboard.

Lease prices start at $279/mo from the firm at 1031 Post Road, 06820.

Punch Offers Multi-Uses

OLD GREENWICH, Conn. – Users can punch and print numeric data on standard tab cards or multiple copy tab cards from signals generated by cable-connected equipment (such as badge/card readers, minicomputers, time clocks, terminals, scales and testing equipment) with the Model 404 Vari-punch, according to Varifab Inc.

Alpha and numeric data is punched at 12 char./sec with average production exceeding 3 card/min.

Unit cost is $1,095. Also available is a unit for punching only at $975 from 1700 E. Putnam Ave., 06870.

Microfiche Reader Costs $265

NEW YORK – GAF Corp. has a reader designed to handle 24:1 and 42:1 computer output microfiche.

The Model 7524 utilizes an 18x and 32x dual lens magnification system to project three-quarter size computer output images on an 11 in. by 8-1/2 in. screen.

The unit accommodates either 4 in. by 6 in. or 3-1/2 in. by 7-3/8 in. horizontal computer page format microfiche.

Costing $265, the unit is available from 140 W. 51st St., 10020.

On Obtaining Equipment

Outside Sources Good Bet for 360 User

By Michael Weinstein
Of the CW Staff

Potential IBM 360 Series hardware buyers should break down planned acquisitions into four groups: CPU, memory, I/O devices and disk or tape storage units.

Using CPU as an example, one finds a half-dozen potential sources. Purchase can be made from the resale market – either for cash or financed. Direct leasing and subleasing are alternatives. CPUs can be rented full-rate from IBM, or can be obtained from IBM on fixed-term rental.

Nearly all components of the average user computer facility have similar sources, but the CPU supplier is not necessarily the best source for the rest of the system.

Acquisition sources are listed below in a matrix with an opinion of the value of each source for each area of equipment. In referencing the chart, users should realize that buying computer equipment is not a definitive science.

In trying to evaluate what is best for

Analysis

a firm, the user should consider development plans for the next few years, the company's immediate financial position and the degree of flexibility offered by each source.

The used computer market is in a constant state of flux; conditions should be checked for some time before buying. Time Brokers Inc. of Elmsford, N.Y. puts out a good reference book, *"The Blue Book of Computer Prices,"* that can help keep users informed of current market prices.

Most of all, prices and terms are not firm. A good businessman can make exceptional deals as outside vendors fight for business not controlled by IBM – be a horse trader . . . negotiate.

The IBM announcement of virtual memory systems has had little impact on the price levels in the 360 line. A good guess is that virtual machines will have little effect on the 360/30 and 360/40 but will affect the resale price – and thus the used purchase price – of the large 50s and 65s.

On larger machines, virtual memory offers greater advantages in operational efficiency.

Equipment	Used Market	3rd Party Lease	IBM	Peripheral Manufacturer
CPU	For planned use of three years or more, a good source.	Prices vary greatly, so take care in selection. Good alternative.	Not competitive unless for short period of time.	A few manufacturer's offer total systems at 30% to 65% below IBM for leasing more than three years. For CPU alone not a good choice.
Memory	Good buys available but should have three-years' planned use.	Leasing companies will increase or reduce IBM core to suit user. Also possible to lease non-IBM core.	IBM does not rent core for attaching to customer-owned machines. New IBM core for purchase is not competitive. For leased machines be careful of servicing agreements before using any alternative to IBM.	Add-on memory very good alternative. Many times excellent price available. Negotiate price and payment for best deal.
I/O Devices	Very high used price in relation to term of planned usage.	When available, a good alternative and should be considered – check service.	Generally good price.	Good alternative as more devices are made available – check resale value of any equipment purchased.
Tapes	Good for 800 bit/in. but limited supply of 1,600 bit/in.	Prices low for 800 bit/in., not many 1,600 bit/in. units available.	Should only be used to round out a system with dual-density drives on short-term rental.	Offers excellent bargains either for sale or lease.
Disks	2311s good buy used; Model 2314 often super buy if planned use more than three years. Be careful of service.	Competitive rates – consider if planned usage is less than two years.	Good source with service for all units.	Consider for all disks except possibly 2311s and Model 2314s.

Evaluation of Sources of System 360 Equipment

Word Processing Added to Typesetting Unit

LOWELL, Mass. – By combining word-processing and editing techniques with a computer typesetting system, users can have a computerized in-house system for producing camera-ready copy from typed input, according to Graphics Systems Inc.

Typed or handwritten copy is given to a secretary who uses a Redactor editing typewriter to create a cartridge tape and a hard-copy proof.

The original author can review the hard copy, returning it to the secretary for editing. When the copy is certified correct, the secretary takes the cartridge to the typesetting operator who inputs special typesetting commands for line length, font, leading, etc.

The typeset operator has a choice of four fonts and either 18- or 36-point sizes. All or any combination of options can be used. For example, the first sentence could be 11-point bold with ensuing sentences 9-point medium. He can specify changes within the copy so that captions are italic. He also can run text around or leave space for photos.

The magnetic cartridge with imbedded typesetting commands is read into the System 1 Computer/Typesetter – a Nova mini with 8K interfaced to a photocomposition device. All operating software is provided with the system.

Output from the computer is in the form of a tape that is loaded in a Kodak Electramatic Processor with a daylight feature. (The daylight feature allows the unit to develop film without darkroom facilities.)

Transferring 10 pages of typed copy to camera-ready "repro-copy" would take about 20 minutes, according to Sam Blum of Graphics.

A typical system sale price of $44,000 with advanced capabilities leads Graphics to feel it can attract many users of IBM Magnetic Tape Selectric Typewriter systems to the new system. An MTST system with two entry stations and an output station would cost about $20,000 according to Blum.

Graphics will train all staff in system operation and offers additional photo-disk type fonts at $170 each.

Production and marketing are being carried on in conjunction with Redactron Corp. which will provide sales support.

Leasing is also available with a typical system renting for under $1,000 from 217 Jackson St., 01852.

Your 360: Our Large Core Store remembers it well.

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How to get the lead out of real time.

1. HYPER-FASTER DUPLICATES 15 MAN-MONTH CICS EFFORT IN TWO WEEKS: June, 1972 . . . County government application rewritten by COMRESS consultant in Hyper-FASTER real time language in two days, following 15 man-month development effort under CICS . . . Operational under Hyper-FASTER in two week's elapsed time (total effort: six man days utilizing original CICS design) . . . Second application (11 man-months allocated under CICS) written by county government dp staff during three-day Hyper-FASTER real time course . . . installed and running in one week (total effort: seven man-days).

2. ON-LINE HOSPITAL INFORMATION SYSTEM USES HYPER-FASTER: October, 1972 . . . Hyper-FASTER T/P monitor supporting major on-line information system development effort at midwest hospital . . . Replaces IBM-distributed Medical Information System Program ("MISP") and Shared Hospital Accounting System ("SHAS") as primary system . . . Info Systems staff reports 4:1 speedup ratio in implementing new hospital applications under Hyper-FASTER as compared to previous support software.

3. HYPER-FASTER/CICS SERVICE BUREAU COMPETITION: June, 1972 . . . Two midwest service bureaus—one running Hyper-FASTER, the other CICS—lock horns for on-line sales data entry application of leading shoe retailer . . . implementation benchmark proposed to prospect as deciding factor . . . Hyper-FASTER application designed, written, tested and demonstrated on Hazeltine video terminal two days following inception of competition . . . CICS competitor "declined to demonstrate . . ."

No lead here.

4. INSURANCE COMPANY BOOTS CICS OUT: June, 1972 . . . Faced with repeated unsuccessful attempts to generate CICS and a 90-day deadline for bringing up a customer record retrieval application, this insurance company opts for Hyper-FASTER, signing 36-month contract two days after technical presentation . . . Decision based largely on strength of Hyper-FASTER's reputation for getting real time systems up quickly.

5. HYPER-FASTER REPLACES FASTER: Spring, 1971 . . . State Government Highways Division installs Hyper-FASTER in one week, including conversion of all batch and on-line FASTER programs to Hyper-FASTER . . . Installation undergoes configuration changes and OS system generation during same week . . . Terminal response times reduced 15:1—from 20-40 seconds under FASTER to 1-3 seconds under Hyper-FASTER.

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For 370/155, 165

IBM Approves Telex Add-Ons

TULSA, Okla. – Telex, like Data Recall and Itel, has received IBM approval to attach add-on memory to the 370/155 and 165.

IBM thus will maintain its CPUs with the approved memory attached.

Telex 6360 expandable semiconductor memories feature error-checking and correction functions that automatically correct all single-bit errors and detect all double-bit errors, according to the firm.

Off-line maintenance is possible by enabling memory diagnostics to be used with the CPU.

The Telex memories are available in five models: 6360-l, 6360-2 and 6360-3 for the 370/155; and 6360-4 and 6360-5 for the 370/165.

All models are field upgradable, according to the firm.

Telex unit	Equivalent IBM unit	Telex Price		IBM Price	
		purchase	lease	purchase	lease
6360-1	370/155 with 262K	$107,175	$2,300	$132,000	$3,000
6360-2	370/155 with 393K	$158,925	$3,400	$198,000	$4,500
6360-3	370/155 with 524K	$209,450	$4,500	$264,000	$6,000
6360-4	370/165 with 262K	$107,175	$2,300	$132,000	$3,000
6360-5	370/165 with 524K	$209,405	$4,500	$264,000	$6,000

Cross-Comparison of Telex, IBM Units

Security Plan 12 Years Ahead of Time?

By Michael Weinstein
Of the CW Staff

LIVINGSTON, N.J. – Saint Barnabas Medical Center is bringing hospital security to new heights with a computer-based system that some observers have described as the "1984 security system."

The on-line system controls access to any area of the hospital or its grounds and provides database information on the activities of all employees at all times during the day.

An IBM System/7, the center of the system, is attached to 50 reader devices throughout the hospital and parking lots. Each employee has an ID card with a magnetic stripe that must be entered and recognized by the system before the individual is granted access to the controlled area.

The system allows access to certain areas for a limited time. For example, an employee who is to be at work at eight might find the door locked automatically at 8:15 even though he had the proper ID.

Parking lots will be designated by shifts, and the system only allows access to employees working on that shift. Of course, a spokesman said, the hospital will open the areas during lunch so people can leave the lot and return.

At the doctors' parking lot, the computer will alert a guard for possible assistance if a physician drives through the entry gate but does not enter the hospital in a specified time.

This is a very useful feature, according to a hospital spokesman, because only last year a doctor slipped in the lot and hurt his leg. With the new system help would arrive quickly.

The same information used to grant access will be transmitted to the hospital computer facility for evaluation and will form the basis of reports to section managers. These reports can then be used to evaluate tardy employees.

Above and beyond the daily operation and report feature of the S/7 Security System the thousands of events relating to security and personnel logged each day will be transmitted directly to a 370/145 at the hospital for further analysis. This information will be used to plan new security measures, regulate personnel on shifts and forecast special hours for private nurses, all to improve hospital efficiency.

"This is a people-oriented system," noted Anthony Scala, hospital president. "We are installing it to make the hospital more secure for our people and to make the most efficient use of the vital health-care skills."

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—— RCC ——

(NOTE: Randolph Computer has recently been deluged with requests by EDP users for a better understanding of "bundled versus unbundled" leasing contracts. Randolph will respond to each inquiry promptly. RCC responses that satisfy EDP user curiosity simply add more users to the growing list of RCC's satisfied customer list — where flexibility and cost reduction become an actuality.)

Strengthen User-Vendor Dialogue

'Unified User Voice' Sought in National Conference

By Edward J. Bride
Of the CW Staff

PHOENIX – A "unified user voice" is the best way to solve problems in the computer community, but creating such a unity has consistently evaded the efforts of both the industry and user sides.

This single voice might help end-users apply the technology better, but it is also necessary to help industry plan priorities for technological developments, according to a staff consultant for Honeywell.

Many applications cross industry lines, according to Robert Bemer of Honeywell's Advanced Systems Technology office here. "Human engineering" and interface problems are common to all types of users, no matter what segment of usage or development interests them most, he commented.

Bemer is one of the two chairmen of the technical program for the first National Computer Conference (NCC) in New York next June.

He will direct the efforts in the Methods and Applications (M&A) Program, and Dr. Carl Hammer, head of computer science for Univac, will direct the Science and Technology Program.

The technical portion of the NCC will actually be divided into three segments, with extensive panel discussions and seminars planned.

The M&A segment is one of the innovations being planned for the first of the annual meetings, which will replace the semiannual "Joint" conferences.

This portion will examine computers from the viewpoints of end users, Bemer said. His part of the program apparently grew out of the "vertical adjunct programs" or user seminars instituted for the Fall Joint Computer Conference.

'Contemporary Topics'

"Particular attention," Bemer said, "will be given to contemporary topics of interest to the user including user requirements and problems." A strengthening of the dialog between users and suppliers of technology is a major purpose of this part of the program, he added.

Hammer said the Science and Technology Program would critically examine a "large spectrum of information-processing systems technology" from the viewpoints of the societies which make up the American Federation of Information Processing Societies (Afips), sponsor of the national conference.

Societies User Groups

Bemer's Methods and Applications Program will emphasize applications specific to such fields as architecture, communications and earth resources management; it will also include social implications, documentation, managerial problems and "definition and solution of problems peculiar to the end-user."

Hammer's Science and Technology portion will include the traditional topics of hardware and logic, microprogramming, software and operating systems, data-base design and program certification, plus data security, cryptography and performance evaluation.

Call for Papers Issued for NCC

NEW YORK – Afips has issued formal instructions for individuals interested in submitting papers for the first National Computer Conference and Exposition (NCC), to be held here June 4-8, 1973.

The general instructions apply to both the Science-and-Technology and Methods-and-Applications programs, and include a restriction to unpublished papers not exceeding 5,000 words (as usual). Each paper should also include an abstract not to exceed 200 words, plus a full set of illustrations keyed to the text and an appropriate set of key-words or index terms.

The broadening of the formal technical program is another step toward broadening the attendance base for the national conference, a move begun when FJCC committees planned the vertical or adjunct seminars.

Another indication of the Afips desire to make the technical program more relevant and timely is the lateness – by comparison – of the deadline for submitting papers for the national show.

The NCC general chairman, Dr. Harvey L. Garner of the University of Pennsylvania, requested paper abstracts by Dec. 31, and actual manuscripts by Feb. 1, 1973, much closer to the conference dates than in previous years.

Science and Technology

Topics suggested for this part of the program include:

Hardware, including logic, components, design and development; technology of processors, peripherals, terminals and communications devices; microprogramming and systems architecture.

Software, including operating systems, programming languages or techniques; data structures, data-base design, documentation and program certification.

Foundations of the computer sciences, including switching theory, information theory, meta-mathematics, automata theory and artificial intelligence.

Solutions to problems arising in administration, business, education, engineering and medicine.

New issues, including data security, cryptography, program validation, performance evaluation, computer and data-sharing networks.

Methods and Applications

Topics suggested for this part of the program include:

Applications specific to such fields as architecture, communications, earth resources management, education, design and production engineering, finance, government, health and medicine, manufacturing and distribution industries, automotive and petrochemical industries, energy industry, law, management, printing and transportation.

The social impact of increasing integration of information processing into human activities, i.e., data banks, wired cities and the monetary system.

Methods whereby access to information-processing technology is improved for the user, e.g., documentation, customizing and self-teaching systems.

Solutions to or definition of existing and anticipated managerial problems of the end-user.

Definition and solution of problems peculiar to the end-user.

Instructions on format and procedure for submission are available from the respective chairmen:

Dr. Carl Hammer, % Univac, 2121 Wisconsin Ave., NW, Washington, D.C. 20007, or R.W. Bemer, % Honeywell Information Systems, P.O. Box 6000, Phoenix, Ariz. 85005.

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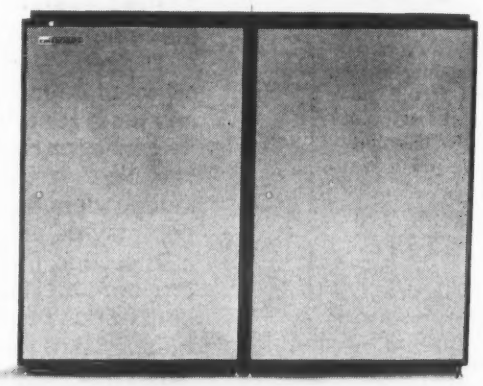

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Two Users, Two Approaches

Payroll Just One Payoff in Building Office System

By Edward J. Bride
Of the CW Staff

OAK PARK, Mich. – A general contractor here has built a really basic applications library for his small computer.

But Cobol is just around the corner for the A.J. Etkin Construction Co.

The firm was one of the first users of the GE55, a small computer that required programming in Basic. The firm has changed over to a Honeywell 58, successor to the GE55 and also compatible with the GE-Basic language.

Following the philosophy that cost-forecasting can be based only on experience, Etkin computes its "experience" weekly, in the form of detailed analyses of all labor and material costs. Job overruns are thus minimized, according to DP Manager Edward Butler.

Many of the general bookkeeping applications were available from Honeywell, written in Minicobol, the manufacturer's small computer language. But Butler said none of these packages was designed for construction companies, so he spent the last three years designing a cost-control system because users in the construction industry must apply all labor and material costs to each individual job, and not just to annual or monthly overhead.

This is the only way overruns can be predicted in the short term, and avoided in the long run, Butler indicated.

Etkin's cost-control system is based on three GE-Basic programs: payroll and labor cost, payables and material costs and fixed assets and construction equipment inventory.

The Small Systems User

While payroll, payables and cost applications have items common to many types of users, there are some differences because of allocating actual man-hours to individual jobs.

Additionally, the fixed assets and construction equipment inventory section includes programs for listing and depreciating Etkin's 2,500 pieces of equipment, ranging from cranes and trailers to power-saws and drills. Each job is charged for rental of the equipment, Butler noted.

While the cost-control system is similar to what is known as "standard" Basic, the applications are being rewritten in Minicobol, Butler reported.

Minicobol, in turn, is similar to standard Cobol, and when Etkin's programs are completed, conversion to Cobol will be a minor step, Butler added.

Then, when the Model 58 is converted from card to disk orientation – a process now under way – Etkin will begin selling the programs to other construction companies.

For Larger Users, Too

Butler has already had inquiries regarding his applications, some of the inquiries coming from users of much larger systems, such as the H200 series.

The Model 58 is all Etkin needs, as the 10K processor still is not fully saturated, he said, but estimating jobs will soon become computerized.

While standard packages are available from Honeywell, Etkin preferred to develop its own industry-oriented applications, and now plans to market the programs through Edaco, a new subsidiary.

The weekly reports include all costs – labor and material – for every item on every job. The actual cost is then compared with the estimated (projected) cost, and overruns, when they occur, are flagged for management action.

The printout also summarizes the major work categories for each job.

The labor cost exception report lists those work items on each job that are the most-above-estimate, and the summary totals of the major work categories for the job, he added.

Weekly payroll is computed and the checks printed within 24 hours, and this application includes the usual deductions for unions, plus vacation accrual, Butler said.

Builder Prefers Magnetic Ledger Card Visibility

BURLINGTON, Mass. – A small construction company here has said "no" to internal storage computers, but not for the traditional reasons of size or cost.

Officials of White Construction Co. said a high degree of activity with subcontractors, especially telephoned inquiries when the availability of information is critical, led them to choose a magnetic-ledger card approach.

"We are constantly on the phone" regarding requisitions, and must have current figures "available and in view at all times," explained Leo A. Martin, controller for the White Construction Co.

A magnetic ledger card computer satisfies the company's need for visual records, while providing capacity for program requirements, Martin commented.

The company uses a Philips P-359 system with core memory of 1,200 words; a 672-digit mag ledger card system and a 30-in. split platen are also used to handle two sets of forms simultaneously. Program changes are entered with standard punch cards.

White's ability to determine unit labor costs each week on all its projects makes it possible to compare to-date expenses with original estimates. Total labor costs are computed for each job from color-coded time tickets supplied from the field, and are then combined with costs for material, equipment rentals and subcontractor expenses for a total figure.

From information on the magnetic stripe of each employee ledger card, the system automatically produces checks after the operator lists the normal hours worked, plus overtime.

Cumulative information on the magnetic stripe is also extracted to produce quarterly 941A forms, unemployment compensation taxes and annual W-2 forms.

With programming needs now about 80% complete, the firm believes the P-359 will meet all expanded accounting needs for the next five years.

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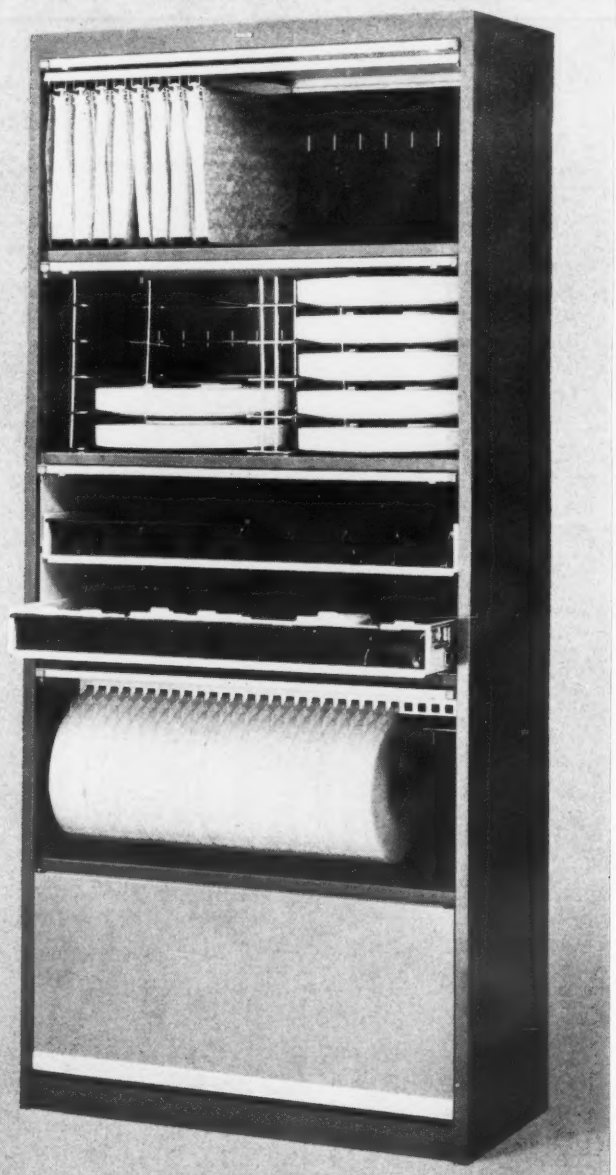

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Russian Scientist Says

Applications Abound in USSR

WASHINGTON, D.C. – In a country like the Soviet Union, with a planned economy, a practically unlimited variety of computer applications is possible, according to Dr. S.I. Samoylenko, vice-chairman of the Council for Cybernetics of the U.S.S.R. Academy of Sciences.

Speaking at the first International Conference on Computer Communication, Samoylenko discussed current national DP projects being implemented in his country.

An airline reservation system called Sirena I is currently being operated by the Moscow civil aviation authority, he said. The system accepts ticket reservations up to 30 days in advance and is capable of "issuing tickets for 600 flights per day," Samoylenko said.

The system includes a central DP site with dual processors which have full duplex communications channels, he said. A Sirena terminal includes a dedicated keyboard printer which interrogates the reservation system and automatically prints tickets.

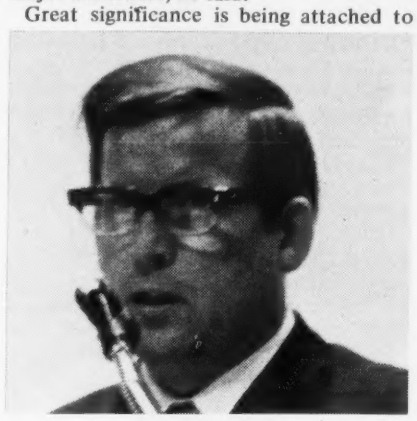
Remote terminals are installed at Moscow airports and in Aeroflot offices in and around the Russian capital, Samoylenko said. By the end of this year, the system will support over 250 terminals in about 30 cities, he added.

In describing industry-oriented systems designed to assist managers in making business decisions, Samoylenko listed the Metal DP system for the distribution of metal products. Metal is a hierarchical multilevel system with defined categories for each managerial echelon, hundreds of suppliers, and tens of thousands of customers, Samoylenko said.

Metal software includes algorithms and subroutine packages for "optimal assignment of production targets. The system allocates resources locking the demands of the customers onto the suppliers, he said. The system can control deliveries and inventories, modify sales programs and process large data arrays for a management information service, he added.

Similar industry-wide systems are being implemented in electrical engineering, chemical, iron, steel, coal, oil and other major industries, he said.

Great significance is being attached to



S.I. Samoylenko

training personnel for computerized and automated systems, the Russian official said. All technological institutes now include a required course on the application of computers for engineering and economic problems, he said. And it is planned to introduce a course on computerized management and control systems for all undergraduates of engineering colleges and university science departments.

The number of higher educational establishments that train computer and automatic control engineers has increased two and a half times in the last few years, Samoylenko said.

New computerized DP systems are being set up at a rapid rate in industry, banking, medicine and public health, research and "practically all other fields of human endeavor," Samoylenko said.

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Report to NSF

Lack of Effective Examples Prevents Broader CAI Use

By Molly Upton
Of the CW Staff

PRINCETON, N.J. – Lack of effective demonstrations of the use of computer-assisted instruction (CAI) is one of the major reasons preventing broader use of computers in education, according to a report to the National Science Foundation by the Interuniversity Communications Council (Educom) on "Factors Inhibiting the Use of Computers in Education."

The term CAI is used throughout the report in a broad, generic sense, and includes gaming, simulation and problem solving.

Prime target areas for demonstrations would be the teaching of basic skills, such as English and math, and the report recommended specific uses of CAI in:

- Remedial programs for the disadvantaged
- Curriculum development within a discipline
- Courses for community colleges and lower level undergraduates
- Education for the handicapped
- Vocational, industrial and military training.

The report was based on a survey of 30 members of the education, publishing and computing fields.

Respondents agreed "the computer's potential is far from being fully utilized in present CAI systems – in fact, in many applications the computer serves merely as a page-turning response-recording device."

Unique Capabilities

As a prerequisite to demonstrating the advantages of CAI over other instructional media, more emphasis should be placed on developing the computer's many unique capabilities, such as flexibility in problem solving, simulation and interactive dialogue, the report stressed.

Other characteristics of the computer which are underused are its "versatility in assuming a variety of roles, . . . responsiveness, and diagnostic capability," it added.

Simulation and gaming were considered important areas of development, since the computer contains the potential for developing decision-making abilities. These abilities, the report noted, are "not part of the usual set of skills specifically developed by traditional instruction methods."

The study also suggested that CAI can be used to gather information about learning, to help evaluate what techniques and materials are educationally sound.

Respondents agreed the "need to acquire greater understanding of the instructional process, and to use this knowledge in developing innovative and effective CAI materials" is a problem of long-range importance.

Teacher's Role

A number of problems have been anticipated or encountered relative to the role of the educational system and the teacher, the report admits. Taking as a premise that "a broad use of CAI will require a change in the established patterns of instruction and a restructuring of the traditional role of the teacher, particularly at the pre-college level," more training and planning of systems to support "a new role" for teachers are needed.

Generally, if CAI can be demonstrated to meet specific needs, teachers will readily adopt it, the report indicated. Thus evaluations of systems should "entail more rigorous cost effectiveness analyses, specification of goals and measurement of instructional effectiveness."

Among the reasons suggested for apparent resistance to CAI are:

- "High cost and problems of measuring cost effectiveness and justifying expenditures
- "Fear of change; wariness of the computer as another technological tool that hasn't lived up to initial promises, such as TV, language labs, etc.
- "Ignorance of computer's potential, limitations and adaptability
- "Clash of values arising from teacher's feeling that the computer will deprive him of highly valued personal relationships with students."

The education of teachers in CAI techniques was considered a prerequisite to full acceptance, but respondents generally disagreed on the role of teachers in conjunction with CAI. The suggestion of designing systems that are controlled by teachers was countered by the view that there "should be a change in educational philosophy which would result in the teacher's role being one of guidance and assistance, rather than control."

In the area of technology, terminal engineering was judged far behind central processor engineering.

Important capabilities for educational terminals suggested by the report included:

- "A high volume random-access audio unit for use in teaching reading and languages
- "A video-cassette attachment for use in presenting fixed information under computer control
- A display capability that includes the use of light-pen and the ability to produce hard-copy output."

Opinion was divided on the need for a natural language processing capability and more exploration of artificial intelligence techniques. One advocate of natural language processing said "for complete mastery of a concept, the student should be able to explain the concept in his own words, compare it with related concepts, correct a mistake in judgment about the concept, and so forth."

Others contended that CAI can teach concepts when used with ingenuity and it's a "waste to try to remake the computer to do something for which it is ill-adapted or totally unadapted, when there exist so many things that the computer can do superlatively well."

Currently, the obstacles to wider CAI use form a "status quo cycle" consisting primarily of lack of good materials and systems, lack of demonstration, school resistance, and lack of mass market and market incentives, the report noted.

But since these are all interrelated, a multilevel program of research and implementation to overcome these obstacles might effectively reverse the cycle, the report concluded.

The full report is available for $4 ($3 for Educom members) from the Interuniversity Communications Council at P.O. Box 364, Rosedale Road, 08540.

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CI Notes

Adapso to Fight Outsiders

NEW YORK – The Association of Data Processing Service Organizations is promising to wage a "long-term, intensive fight" against the incremental marketing of computer services by firms whose main business is in other fields.

"The marketing of computer services by banks, bank holding companies, communications carriers and others is but a part of an increasingly serious and damaging trend by conglomerates and others to use the power they have in their primary business to interfere with free and open competition in the computer services industry," the organization said.

"This must stop if the computer services industry is to continue to be innovative and produce benefits for the entire American economy," it added.

Memorex Plans Refinancing

SANTA CLARA, Calif. – Memorex has announced a tentative reorganization plan under which it will acquire all of ILC Peripherals Leasing Corp. and its major lenders will reduce the Memorex high interest rates.

ILC is presently a 20%-owned affiliate and handles the leasing of most of Memorex's products. The acquisition will be for 300,000 shares of Memorex stock.

Even though the agreement will increase the amount of cash available to the firm, according to Laurence Spitters, president, it is understood the firm is continuing to look for other financing.

Star Developer Leaves CDC

ST. PAUL, Minn. – James E. Thorton, the man responsible for the development of the Star 100 computer system for Control Data Corp., is taking a leave of absence, but the firm indicated it would continue to give Star 100 development "top priority."

Supershorts

Data 100 Corp. and Randolph Computer Corp. have signed an agreement under which Randolph will purchase up to $30 million in Data 100 equipment over the next three years. The equipment will have been leased to customers by Data 100.

– – –

Advanced Memory Systems has now added the N-Channel MOS semiconductor memory process to its repertoire with the first product a 1,024 Kbit static random-access memory with 150-nsec cycle time.

– – –

Digital Equipment Corp. has been granted a third patent by the U.S. Patent Office covering the architecture of the unibus communication system of the PDP-11 family of minicomputers. The other patents cover the processors and peripherals in the line.

– – –

Mostek Corp. will supply random-access memory units to Burroughs Corp. under a contract valued at over $1.5 million for 300,000 1,024 Kbit units.

– – –

Orbital Systems Inc. has appointed Computer Ancillaries International as its exclusive sales agent in Europe for its data entry systems.

– – –

Overseas shipment of Quantor's microfiche recorders under an international sales agreement with National Cash Register has now extended to three European countries; Spain, England and West Germany.

– – –

The Air Force Logistics Command has accepted for testing the first part of the Advanced Logistics System computers – Control Data Cyber 70 machines.

Foreign Population Up

Japan DP Installation Value Rises 27.5%

By a CW Staff Writer

WASHINGTON, D.C. – There were 12,809 general-purpose computer systems in operation in Japan at the end of March 1972, the Department of Commerce's Bureau of Domestic Commerce reported recently.

The total value of the computer equipment in use was approximately $3.7 billion, Commerce added, noting the 1972 installation figures represent an increase of 36.1% in terms of numbers and 27.5% by value over the previous year.

At the same time Commerce noted the value and number of foreign computer systems installed increased during the last Japanese fiscal year – a reversal of a trend of several years which saw the value and number of foreign computers drop.

All the figures used by Commerce in figuring the size and value of the Japanese market come from the Japan Electronic Computer Co. for the fiscal year, which ended March 31.

The foreign manufacturers hold the largest lead in installed large-scale systems, with 63.8% of the systems valued at over $1.6 million, Commerce said. In all, it said there were 439 of these machines installed.

In the next largest class (valued at between $811,689 and $1.6 million), foreign manufacturers accounted for only 50.8% of the installations. The total number of machines in this class was 725, the department said.

However, in the medium-sized class, the Japanese manufacturers hold a clear margin. There were 3,769 machines installed with a value of between $129,871 and $811,688, the department said, with Japanese firms supplying 72% of the total and foreign firms accounting for only 28%.

In the small category, machines under $129,870, the Japanese manufacturers supplied 59.8% of the machines installed and the foreign firms had only 40.2%.

The largest user group in Japan is the wholesale and retail area, Commerce said, with around 2,700 computer installations.

The finance area represents the second largest application area, followed by the electrical machinery area. Other large application areas include chemicals and petroleum and electric power and gas firms, in addition to universities, local government and government-sponsored organizations.

On-Line Interest

There is also an increasing interest in on-line terminal equipment, with the wholesale and retail firms using 16,294 terminals and the transportation and communications users having 1,742 such devices.

Terminals are also heavily used by government-financed organizations, the security business and in the transportation machinery sector of the economy, followed by the data communications services business and the chemical and petroleum industry.

In 1972, the foreign manufacturers accounted for 45.2% of the value of computer equipment installed, up from 44.7% the year before, Commerce noted, but still under the 1970 figure of 46.7% and way under the 54.9% share of market registered in 1967.

In terms of the number of installed systems, foreign firms accounted for 33.3% of the installations, up from 29.2% the year before and about equal with the 32.9% registered in 1967.

Honeywell Branch Seeks Reversal Of Texas County IBM Contract

By Michael Weinstein
Of the CW Staff

FORT WORTH, Texas – Honeywell Inc. has charged that the bid specifications for a proposed county computer facility were biased.

In many cases specifications appeared to come from the IBM manual on the 370/145, a Honeywell employee argued.

As a result, a branch office of Honeywell wants Tarrant County to reverse its decision to buy IBM equipment or have an impartial panel rule on the specifications set up by the county.

Honeywell is not the first company to suspect slanting in the proposal. After reviewing the specifications, Univac refused to bid.

A spokesman for Univac stated the firm concluded from the start that the bid was set up so only IBM had a chance to win and so it decided not to bid.

Only 10 Days

The bias is not considered deliberate or fraudulent by the competing firms but rather it is believed the county's computer expert had only 10 days to prepare specifications for a new system. His previous experience had been in Dallas as DP manager of an installation using IBM equipment, officials noted.

In a previous meeting Honeywell, IBM and Burroughs were considered, but IBM won the contract after a split vote. Two commissioners voted for Honeywell and two for IBM. County Judge Howard Green voted to break the tie. The other two commissioners then made it a unanimous vote.

Low Bidder?

Honeywell was the low bidder, according to the company's local branch, and if the evaluation had been done properly the county could have saved from $4,000 to $5,000/mo, a spokesman stated.

Further, no consideration was given to fringe benefits such as education, he added.

Honeywell's assertion was disputed by the county auditor who said there was "no validity" in the cost differences cited by Honeywell.

Bill Roberts, the new county DP chief, stated that IBM's bid was the best and the committee made its recommendation impartially.

Potter Data Unit Enters Maintenance Business

MELVILLE, N.Y. – Potter Data Products Service Inc. has entered the service and maintenance business for OEM and other manufacturers with a nationwide organization to offer service on a contract basis.

The firm will provide field service, preventive maintenance, warranty service, reconfiguration and reconditioning under contracts ranging from the time and materials type to a full maintenance agreement. The firm will also offer services in Canada, the UK, Germany and Austria in addition to the U.S.

360/20 Popular

Georgia User Preferences Show Little Change

By a CW Staff Writer

ATLANTA – A statewide survey of computer users has indicated the IBM 360/20 is the most popular machine, followed by the 360/30 and the 360/40.

Of the 659 computers identified in the survey, 100 installations – 15% of the total – use 360/20s; 60 users, or 9%, operate 360/30s; and 38, or 5% use 360/40s.

The survey was conducted by the University of Georgia with assistance from the Data Processing Management Association and other professional associations.

The overall picture in Georgia – based on the survey – appears to be one of little change. Some firms have gone out of business, but these were offset by new users. The overall increase of users over last year is 8%.

Although there is a continued growth rate in the number of computer users in Georgia, the growth rate is slower than over the last few years.

In 1969, 336 users had a total of 608 computers. The 1970-71 survey identified 471 users with 608 computers. The most recent survey found computers spread among 503 users.

There has been no major shift in user preference to type of computer. Over half of the users prefer IBM with NCR, Univac and Honeywell controlling about one-third of the user population. The remaining users are spread thinly among the other manufacturers.

The survey found a significant number of second-generation systems still in use: 29 IBM 1401s are still active along with a sprinkling of 1440s and Univac 1004s.

One new development among users, the survey noted, was the appearance of various disk drives used in conjunction with IBM or other mainframes.

In applications usage by these installations, major areas continue to be payroll, inventory control, accounting, order status and inquiry systems and insurance applications.

Users' Choice of Systems

Company	1971-72 %	1970-71 %
IBM	54.8	56.3
NCR	10.2	8.9
Univac	9.7	10.2
Honeywell	9.3	9.2
Burroughs	4.8	4.4
DEC	3.3	2.3
RCA	2.4	2.6
Control Data	1.7	1.2
GE	1.7	2.5
Total	97.8*	97.6

***Bunker Ramo, General Automation, General Research Industries, Litton, Monroe, Royal Precision Co., Scidata, Varian and Xerox account for the remaining 2.2%. Each of these has less than 1/2% of the total.**

User Preference By Manufacturer for Both the 1971-72 and 1970-71 Periods.

Unified Industry Sought

Ifip Congress Hears Plans to Combat U.S. DP Lead

Special to Computerworld

SOFIA, Bulgaria – Europe can afford only one computer company if it is to survive the influence of IBM, attendees at the general assembly of the International Federation for Information Processing (Ifip) were told here recently.

Maurice Allegre, delegate of information in the French Government, called for a unified European computer industry to combat a "virtually intolerable situation," the thorough domination of the European computer community by one company especially by a non-European company.

In fact, U.S.-headquartered companies control the entire world's computer industry, he said.

He made his remarks during a state-of-the-industry session which featured overviews of four market areas – the U.S., Western Europe, Eastern Europe and Japan.

Allegre's suggestion that a unified industry is needed, and that users should give preference to native computer companies, was challenged by Patrick J. McGovern, who explained the U.S. market at the meeting.

Industry in Transition

McGovern, president of International Data Corp. and publisher of *Computerworld*, said the computer industry in Europe and the U.S. is in a state of transition, from emphasis on new users to emphasis on repeat customers.

To illustrate his point, McGovern said in 1972 more than 90% of the total industry revenue, and 80% of the orders for new EDP equipment and services in Europe is coming from customers already using computers.

The primary objective of the manufacturer, McGovern stated, should be to "maximize his current customer loyalty" and "concentrate on developing a concentrated expertise in limited range industries and application areas."

Rather than aim for 30% of the UK market, he explained, a company should aim for 20% of the airline reservation field, for example.

IBM and the World

While Allegre complained that IBM last year shipped 56% of the value of the world's computers – 32% to non-U.S. users and 24% to the U.S. – and that non-U.S. companies had virtually no shipments to the U.S., McGovern suggested U.S. companies would "buy European" if they trusted the particular vendor.

Foreign makers would find good prospects in the U.S., McGovern said, if they could show U.S. companies they thoroughly understood application requirements of the users' businesses, and had effective service capabilities.

Worldwide marketing and support ability was highlighted by another statistic. McGovern said the 500 largest corporate EDP users in the U.S. spent over 60% of the country's total DP expenditures, and the same 500 organizations also accounted for 20% to 25% of European DP expenditures.

Soviets Push Production

Computers are still used primarily in the industrial sector to increase productivity in the durable product and process industries of the Soviet Union, according to A. Gusgov.

The five-year economic plan calls for an increase of 260% in the number of computers used there, Gusgov said; this means 25,000 new systems in 2,000 new sites in the Soviet Union and Eastern Europe, he stated.

In Japan, the Ministry of Trade and Industry (Miti) is encouraging the six computer manufacturers to form into three pairs, to strengthen the domestic industry against the upcoming liberalization of import of computer processors, software and terminals.

K. Nakahara, general manager of Fujitsu's System Laboratory of Information Processing, said the combination of his company and Hitachi has created a computer combine now larger than IBM in Japan.

Fujitsu-Hitachi has 31.6% of the Japanese market, while IBM is credited with 29%, he said.

Miti is awarding $110 million in development grants to the three pairs of Japanese computer manufacturers, to stimulate their development of a "3.5 generation" of computers and peripherals, to compete primarily with the IBM product lines, Nakahara said.

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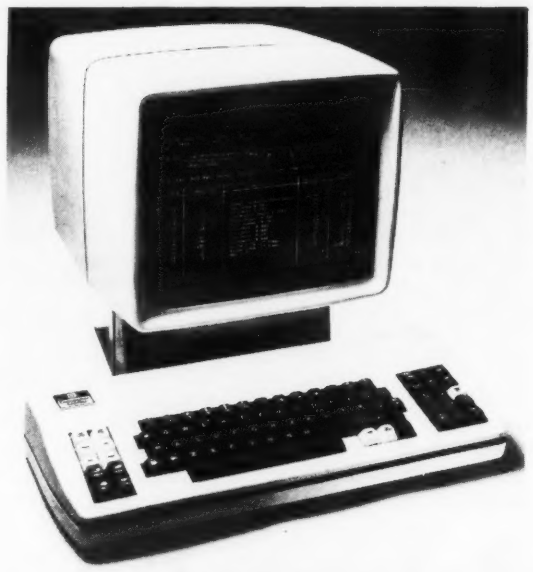

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Orders & Installations

The Los Angeles, Calif., Police Department has ordered an EMR 6145 twin computer system to serve as the control center of a computerized communications system that will make updated file information available to police officers. The system will access several data bases including: L.A. City Data Service Bureau; three state files, L.A. County Justice Data Center; and the National Crime Information Center (NCIC).

The National Safety Council has installed a Burroughs B3500 system for billing, order entry, marketing information and accounting.

General Electric Co.'s Nuclear Energy Division has ordered a Sierra Data Systems SDA-770 factory data system.

R.N.-AAA Co., Inc. in Chicago has ordered a Univac 1106 and two 9300s for use in its service bureau operations.

U.S. Naval Supply Centers in Charleston, S.C., and Pearl Harbor, Hawaii, have installed Quantor 105 computer output microfiche recorders to augment IBM 1410 computers in the Navy's automated inventory control system.

The Diplomat Hotel at Hollywood, Fla., has ordered an NCR 101 for handling reservations and general accounting.

Lockheed Aircraft Corp. has installed an Inforex, Inc. Intelligent Key Entry System.

Steelcase, Inc., Grand Rapids, Mich., has installed an Ampex Model ARM-3360 replacement core memory to expand its IBM 370/155.

Actron Industries, Inc. has ordered an Information Displays, Inc. Idiiom/II-based Idads, an automatic drafting system. The unit will be used by an automobile firm in conjunction with other digitizing and drafting equipment.

Federal, City Agencies

Ecology Is Theme of Several Contracts

NEWTON, Mass. – Several recent contracts reflect growing interest in ecology-related studies.

The Department of the Interior has awarded the Raytheon Co.'s Equipment Division, Autometric Operation, a $130,144 contract for further development and testing of a Natural Resources Information System. The project is part of the department's Earth Resources Observation System which involves receiving, interpreting and disseminating data from aircraft and spacecraft to aid resource management.

The contract, which will be administered by the Bureau of Indian Affairs and Bureau of Land Management, will also involve data from the Geological Survey, Bureau of Mines, National Park Service, Bureau of Sport Fisheries and Wildlife and the Bureau of Outdoor Recreation. The area of study will include the California Desert, Colorado River area, Four Corners and Black Mesa in Arizona and New Mexico.

Seismic Study

Environmental Research Corp. has begun a one-year seismic study of the Lake Mead region in Nevada and Arizona to determine the relationships that exist between earthquake activity and large artificial lakes.

The U.S. Geological Survey made the award to better evaluate relative merits of future dam sites. The study will examine the degree to which earthquakes may be triggered by large reservoirs created by dams.

The City of Palo Alto, Calif., has selected Systems Control, Inc. to develop and evaluate a computer-controlled system for wastewater treatment. The project is to determine the most effective automatic control of the activated sludge process and to develop cost-performance statistics comparing automatic and manual control.

The study is designed to prove that existing wastewater treatment plants can be upgraded with new instrumentation to provide higher quality effluent, rather than being expanded to meet future environmental standards.

An IBM 3/7 will be used to evaluate dissolved oxygen, return activated sludge, sludge blanket depth, mixed liquid suspended solids, total organic carbon in the primary effluent and separately in the secondary effluent and biological respiration rates.

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Aussie Agency Sets 'Buy at Home' Plan

Special to Computerworld

CANBERRA, Australia – The Federal Government appears to be extending its offset purchasing policy into the field of computers, television sets, and radios.

The Department of Trade and Industry and the Australian Industries Development Corp., a government-formed organization, are expected to expand the Australian electronics industry regardless of cost or economics.

The policy would mean DP manufacturers supplying the Federal Government would have to show plans to produce computer or related equipment in Australia.

The Government is prepared to apply the policy to commercial as well as defense-related purchases and to include Federal Government-dependent organizations (possibly universities and government departments) within the scope of the policy.

The Government policy is expected to lead to a considerable expansion of the Australian industry supplying computer peripherals and components.

This expansion will take place without any public inquiry into costs and benefits, and will be protected by the Government's local content requirement without any need for specific tariff protection or public inquiry by the tariff board.

Contracts

Logicon, Inc. has been awarded a $278,000 Air Force contract to develop an interpretive computer simulator for a spacecraft computer.

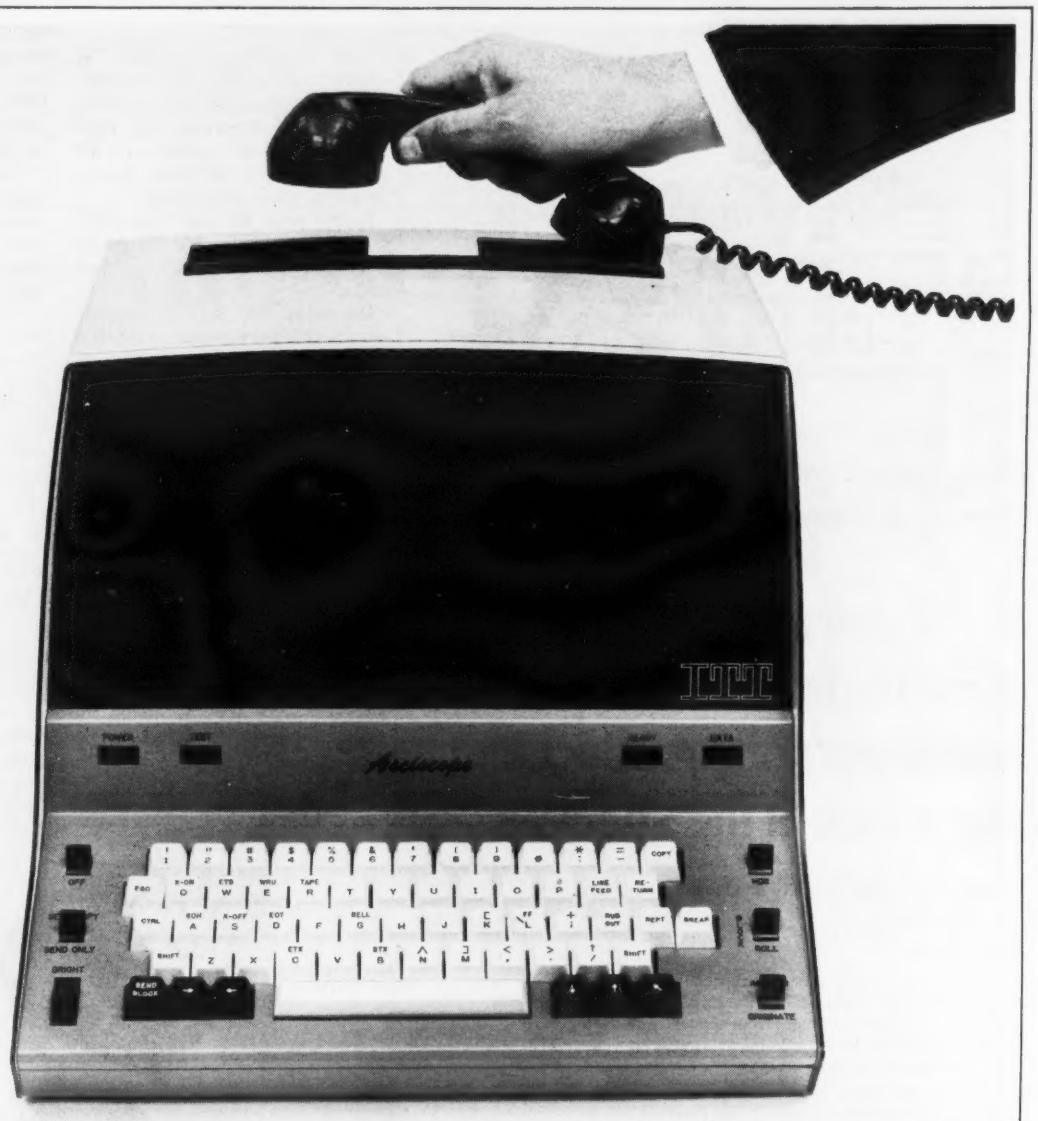
Investment Control, Inc., a subsidiary of Computer Dimensions, Inc., has contracted for Sanders Associates Inc. 620 Can Do terminal systems over the next five years. The terminals will be used by automobile dealers for parts inventory transactions.

Computer Products, Inc. will supply Datacraft Corp. with its Real Time Peripheral line of interface equipment under a $100,000 contract.

General Automation, Inc. has been awarded an $850,000 Navy contract for seven 18/30 computer systems at Naval Air Rework Facilities in California and Rhode Island.

International Computing Co. has been awarded a contract by ITT Space Communications Inc. for terminal test programs.

Data Dimensions, Inc. has been retained by John W. McGrath Corp. to provide systems management services.



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FCC Decisions to Promote Competition Seen Hurt by AT&T Policies, Inaction

By E. Drake Lundell Jr.
Of the CW Staff

WASHINGTON, D.C. – The two recent decisions of the Federal Communications Commission (FCC) to foster competition in the data communications area (Carterfone and specialized common carriers) may not have had the desired effects.

Panelists at a recent meeting here indicated that neither decision had as yet brought the desired amount of competition to the business and they warned that in the future competition might be further restricted unless the FCC is very careful.

Kenneth A. Cox, of MCI Communications Corp. and a former FCC Commissioner, said MCI was worried over competition from the established common carrier (AT&T) with the specialized carriers.

Fair Competition

"Our concern," he said, "is whether they will also comply with the injunction to compete fairly – and whether the FCC can detect or correct unfair pricing or other practices, if any, in which they may engage."

In the past, he said, "the FCC has not had noticeable success in dealing with problems of this kind."

He noted that AT&T "can file any tariffs they please" and that hearings on those tariffs, if challenged by the competition, can drag on for years.

This, he said, "can be very time consuming and costly for a specialized carrier which is not in a position to pass its expenses on to a large class of users."

The Commission, he said, "is going to have to make clear what is meant by 'full and fair competition.' "

New Services

One method the Bell system uses to restrict competition, he indicated, is announcing new services which compete with the specialized common carriers.

"There would clearly be nothing wrong with these implied promises of new wonders to come – if they were really credible," he said, adding: "But Bell has had something of a history of announcing new services with great fanfare, and then delivering them belatedly, or in greatly reduced quality.

"What may be accomplished by this strategem is the impoverishment of competition before it can really develop. Potential customers who might have turned to the competitive services may be dissuaded or intimidated from doing so," he warned.

If, he concluded, "the commission is not vigilant and creative in performing its regulatory functions, competition in communications may never fully come into existence."

Carterfone Response

The Carterfone decision, William H. Melody of the University of Pennsylvania said, promised to open new competition by allowing interconnection of non-Bell equipment to the network.

"Yet, market response has not been as great as expected because of the delays in implementing Carterfone and the obstructionist tactics of the Bell System. Contrary to common belief, the Carterfone decision signaled the beginning of an interconnection policy debate at a new level and not a resolution of the issue."

He said Bell had used the argument of technical harm to the network through interconnection to hide its real objections.

"There is a serious problem that technical standards may be created as economic barriers to entry replacing the former interconnection tariff restrictions.

"Successful implementation of interconnection policy will require both recognition of the benefits as well as the harms and risks, and effective regulation to prevent Bell's predatory pricing practices in both the communication services and equipment markets," he added.

Technical Debate

The problem, he said, is that since the Carterfone decision prohibited interconnection restrictions used as artificial economic weapons against competition, "the economic debate now has been shifted by the Bell System to a framework of technical issues, standards, constraints and terminology."

Since the antitrust laws were used as a basis for the Carterfone decision, he said, "it is likely that they will be the best weapons to keep interconnection markets open and anticompetitive practices of telephone companies limited.

Economics Eclipsed

"The issue of technical harm has generally been blown out of proportion," he said, indicating that the "standards and certification problems should be recognized as essentially economic in nature and developed in terms of consideration of the benefits and costs of maximized interconnection opportunities."

The real development of interconnection, he concluded, "is still on the horizon awaiting the development of standards which is likely to progress at an even slower pace than in the past."

TI Announces Tester For Digital Circuits

HOUSTON – A computer-controlled system for testing integrated circuits and electronic modules – such as printed circuit board assemblies – is available from Texas Instruments Inc.

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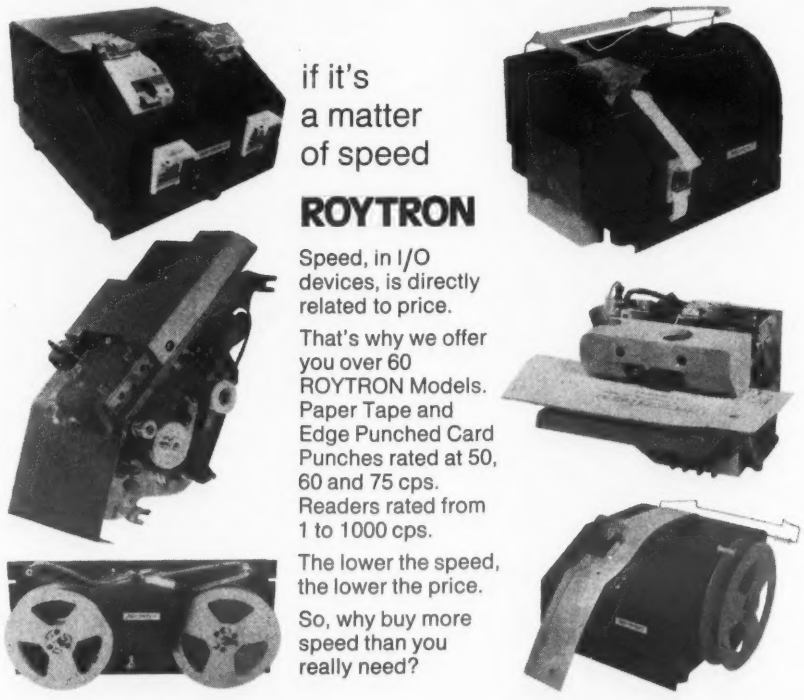

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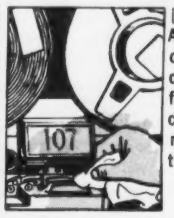

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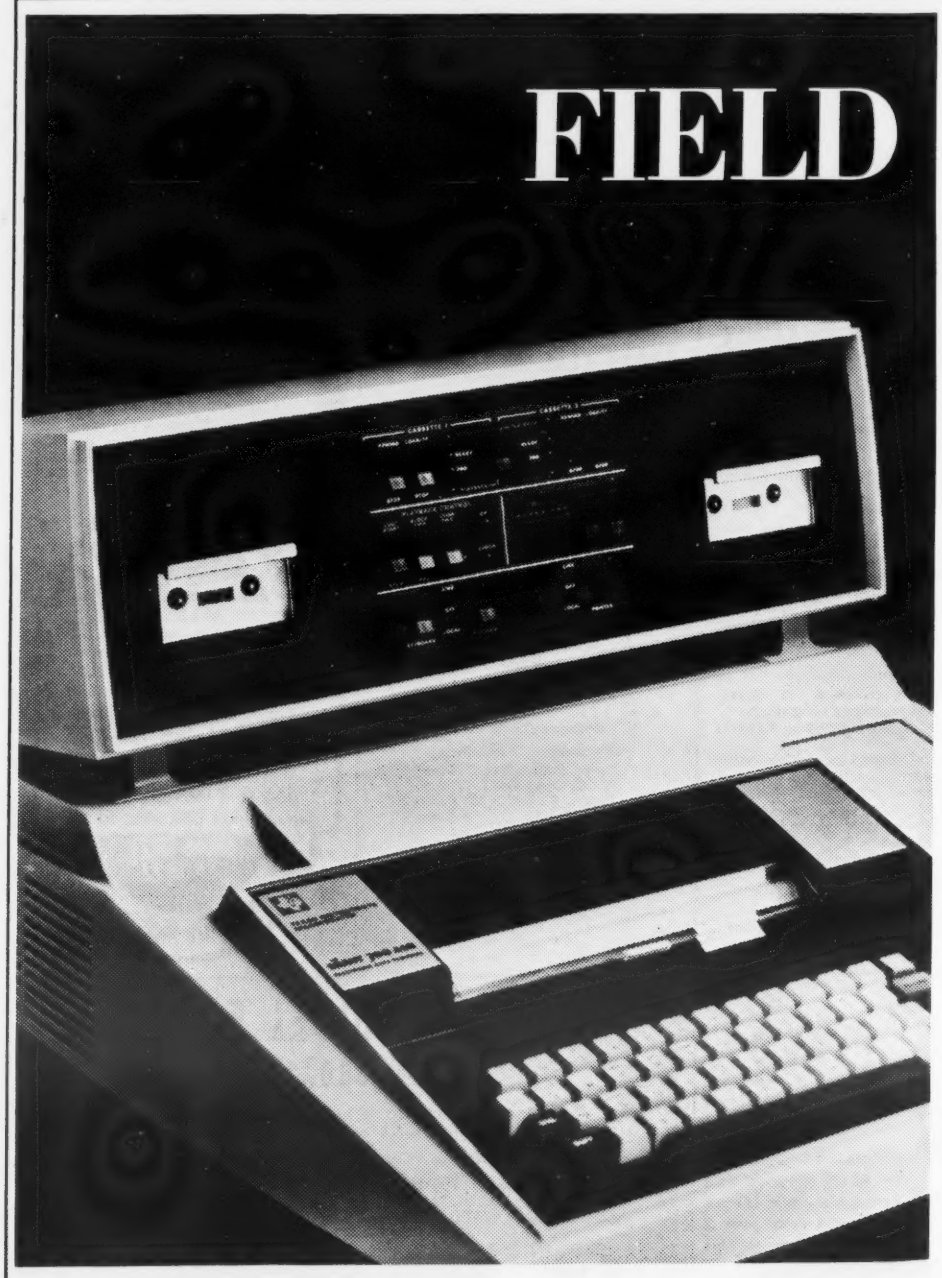

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DEC Earnings Rise 17% in First Quarter

MAYNARD, Mass. – Digital Equipment Corp.'s results for the first quarter ended Sept. 30 include a 35% rise in revenues and a 17% jump in earnings compared with the year-ago period.

The strong performers in the quarter were the medium-scale PDP-11/45 and the larger Decsystem-10. Since shipments began in the fourth quarter of 1972, more than 100 11/45s have been shipped, the firm said.

Revenues rose to $51.7 million from $38.4 million a year ago, while earnings reached $3.4 million, or 33 cents a share, compared with $2.9 million, or 29 cents a share in the same year-ago period.

The increase in sales over a year ago and the current order rate reflect the improvement in general business conditions, the wide acceptance of the PDP-8 and PDP-11 minicomputer systems, and improvement in shipments of the larger, more powerful Decsystem-10, according to President Kenneth H. Olsen.

Telex Quarter, Half Earnings Drop

TULSA, Okla. – Second-quarter earnings at Telex Corp. follow the trend set in the first period by declining in comparison with figures from the 1971 periods. However, revenues in the quarter ended Sept. 30 rose.

Despite first-time overseas profits of $20,000, the firm's earnings declined to $704,000, or 7 cents a share from $953,000, or 9 cents a share last year, when there was a $151,000, or 1 cent a share loss from foreign operations.

Revenues totaled $21.5 million, up from the $19.6 million in the same 1971 period.

Although the sales value of equipment placed in service and lease rental income for the quarter rose, the company had firm orders for sale or lease of equipment with a sales value of $30.6 million, compared with $55.8 million at the same time last year.

Installed Value

The value of equipment installed reached $18.1 million, up 24% from $14.6 million during the same quarter last year. Lease rental income reached $2.8 million for the three months, up from $2.4 million a year ago.

In the six months, revenues declined to $40.9 million from $44.2 million a year ago, as did earnings, which tumbled to $1.4 million, or 14 cents a share, compared with $2.7 million, or 26 cents a share in the 1971 period.

Earnings Outpace Revenues in Year At Data General

SOUTHBORO, Mass. – Minimaker Data General Corp. topped off fiscal 1972 with revenues rising 98%, and earnings more than doubled.

The firm has delivered more computers in the year than in the past three-and-a-half years of its operation, according to President Edson D. deCastro.

Revenues totaled $30.3 million, compared with $15.3 million a year ago, while earnings soared to $3.9 million, or $1.47 a share from $1.6 million, or 67 cents a share a year ago.

In the 17-week period ended Sept. 30, Data General's revenues reached $11.4 million compared with $6.2 million in 1971.

Earnings more than doubled, to $1.5 million from $700,000 in the same period last year, when earnings were restated to reflect a pooling of interests.

As of Sept. 30, Data General had installed more than 4,150 Novas, it said.

SEL Quarter Earnings Boosted by Credit

FORT LAUDERDALE, Fla. – Systems Engineering Laboratories, Inc. managed to turn its slightly increased first-quarter revenues into improved earnings, but only with help from a large special credit.

Revenues for the quarter ended Sept. 29 rose by $27,000 to $3.4 million. Earnings, bolstered by a $322,000 special credit for sale of a building and land and tax credits, reached $362,000, compared with $271,000, including a $95,000 tax credit, in the 1971 period.

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November 1, 1972

Vol. 1 No. 5

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Computerworld Stock Trading Summary

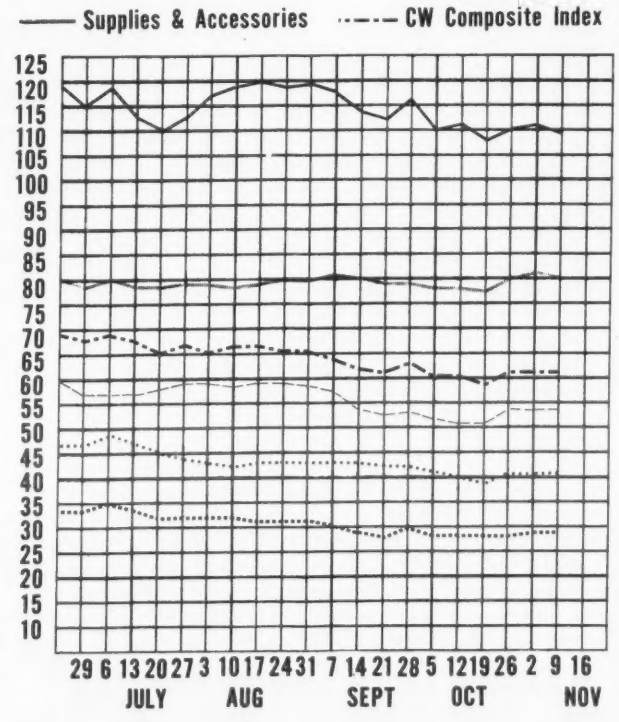
All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

CLOSING PRICES THURSDAY, NOVEMBER 9, 1972

EXCH		1972 RANGE (1)	CLOSE NOV 9 1972	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 3	2	- 1/4	-11.1
A	APPLIED DATA RES.	4- 7	4	- 1/4	-5.8
O	APPLIED LOGIC	1- 4	2 3/4	0	0.0
N	AUTOMATIC DATA PROC	72- 99	95 1/2	-2 1/2	-2.5
O	BRANDON APPLIED SYST	1- 2	3/4	- 1/4	-25.0
O	COMPUTER DIMENSIONS	6- 14	5 7/8	- 1/8	-2.0
O	COMPUTER DYNAMICS	1- 4	1 1/4	- 1/8	-9.0
O	COMPUTER NETWORK	3- 7	3	- 1/4	-7.6
N	COMPUTER SCIENCES	4- 10	4 1/2	- 3/8	-7.6
O	COMPUTER TASK GROUP	1- 2	1	0	0.0
O	COMPUTER TECHNOLOGY	4- 8	4	0	0.0
O	COMPUTER USAGE	7- 14	8	+ 1/4	+3.2
O	COMP AUTOMOT REPORTS	5- 9	8 1/4	- 1/4	-2.9
N	COMPUTING & SOFTWARE	14- 28	14 1/4	- 3/8	-2.5
O	COMRESS	1- 3	1 1/4	0	0.0
O	COMSHARE	5- 10	8 1/2	- 1/8	-1.4
O	DATATAB	5- 9	4 3/8	- 1/8	-2.7
O	EDP RESOURCES	2- 8	3 1/4	0	0.0
A	ELECT COMP PROG	1- 5	2	+ 3/8	+23.0
N	ELECTRONIC DATA SYS.	43- 65	57 1/4	+4 3/4	+9.0
O	INFORMATICS	5- 11	5 3/8	- 1/4	-4.4
O	I.O.A. DATA CORP	1- 3	7/8	+ 1/4	+40.0
O	KEANE ASSOCIATES	4- 7	4 1/2	+ 1/2	+12.5
O	KEYDATA CORP	7- 13	11 1/4	- 1/2	-4.2
O	LOGICON	4- 9	5 1/8	- 1/2	-8.8
A	MANAGEMENT DATA	4- 10	4 3/8	- 1/4	-5.4
O	NATIONAL CSS INC	8- 31	29 1/2	- 1/8	-0.4
O	NATIONAL INFO SRVCS	2- 5	1 3/4	0	0.0
P	ON LINE SYSTEMS INC	8- 25	24 7/8	- 1/8	-0.5
N	PLANNING RESEARCH	6- 17	8 3/8	+1 5/8	+24.0
O	PROGRAMMING METHODS	20- 24	23 1/2	+ 1/4	+1.0
O	PROGRAMMING & SYS	1- 2	1 1/4	- 1/8	-9.0
O	RAPIDATA INC	5- 27	24 3/4	-1 3/4	-6.6
O	SCIENTIFIC COMPUTERS	2- 4	2 1/4	+ 1/4	+12.5
O	SIMPLICITY COMPUTER	1- 5	3	- 1/4	-7.6
O	TBS COMPUTER CENTERS	3- 6	3 1/4	0	0.0
O	TCC INC	1- 3	3/4	0	0.0
O	TYMSHARE INC	7- 11	8 5/8	- 3/4	-8.0
O	UNITED DATA CENTER	5- 8	6	- 1/4	-4.0
N	UNIVERSITY COMPUTING	10- 26	10 5/8	- 5/8	-5.5
A	URS SYSTEMS	6- 10	7 3/4	- 1/4	-3.1
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	34- 49	35	-1 1/2	-4.1
O	ADVANCED MEMORY SYS	12- 23	18 1/8	- 5/8	-3.3
N	AMPEX CORP	5- 15	6 3/4	- 5/8	-8.4
O	ANDERSON JACOBSON	5- 8	4 1/4	0	0.0
O	ATLANTIC TECHNOLOGY	1- 11	1/4	0	0.0
O	BEEHIVE MEDICAL ELEC	1- 6	6 1/4	+ 1/2	+8.6
A	BOLT,BERANEK & NEW	5- 21	13 1/8	- 3/8	-2.7
N	BUNKER-RAMO	9- 14	9 1/8	- 5/8	-6.4
A	CALCOMP	10- 25	10 1/8	- 5/8	-5.8
O	CAMBRIDGE MEMORIES	9- 15	11 3/8	+ 1/2	+4.5
O	CENTRONICS DATA COMP	6- 27	20	-1 1/2	-6.9
O	COGNITRONICS	2- 5	2 3/8	0	0.0
O	COMPUTER COMMUN.	1- 7	2 5/8	- 1/4	-8.6
A	COMPUTER EQUIPMENT	3- 4	2 3/4	0	0.0
O	COMPUTER MACHINERY	7- 13	10 1/2	+ 1/8	+1.2
A	COMPUTEST	3- 9	4 5/8	+ 1/4	+5.7
A	DATA PRODUCTS CORP	3- 7	3 7/8	+ 1/4	+6.8
O	DATA RECOGNITION	1- 5	3/4	0	0.0
O	DATA TECHNOLOGY	2- 5	2 1/2	0	0.0
O	DI/AN CONTROLS	0- 8	4 1/4	- 1/8	-2.8
N	ELECTRONIC M & M	3- 8	4 3/4	0	0.0
O	FABRI-TEK	2- 5	3 3/8	+ 1/8	+3.8
O	GENERAL COMPUTER SYS	7- 16	8 1/4	+ 1/2	+6.4
N	GENERAL ELECTRIC	59- 70	65	- 1/4	-0.3
N	HAZELTINE CORP	7- 13	7 1/2	- 5/8	-7.6
O	INFOREX INC	20- 36	23 1/4	+2 3/4	+13.4
O	INFORMATION DISPLAYS	1- 5	1 1/2	0	0.0
A	LUNDY ELECTRONICS	8- 14	8 3/8	- 5/8	-6.9
O	MANAGEMENT ASSIST	1- 2	1/2	0	0.0
N	MEMOREX	16- 38	17 7/8	-1 1/4	-6.5
A	MILGO ELECTRONICS	15- 44	15 7/8	-1	-5.9
N	MOHAWK DATA SCI	13- 27	13 3/8	-2 3/8	-15.0
O	OPTICAL SCANNING	6- 16	6 1/2	+ 3/4	+13.0
O	PERTEC CORP	8- 17	8 3/4	- 1/8	-1.4
O	PHOTON	6- 15	7	- 5/8	-8.1
A	POTTER INSTRUMENT	7- 21	9 1/4	+ 3/8	+4.2
O	PRECISION INST.	4- 13	4	- 1/4	-5.8
O	RECOGNITION EQUIP	5- 15	7 7/8	+1 1/4	+18.8
N	SANDERS ASSOCIATES	13- 21	15	+ 1/8	+0.8
O	SCAN DATA	5- 13	5 1/2	+ 1/2	+10.0
O	STORAGE TECHNOLOGY	17- 39	32	+3 5/8	+12.7
O	SYCOR INC	7- 11	10 1/2	- 1/2	-4.5
O	TALLY CORP.	8- 15	11 1/4	0	0.0
N	TEKTRONIX INC	34- 64	50 1/2	- 3/8	-0.7
N	TELEX	6- 15	6 3/8	- 1/4	-3.7
O	WILTEK INC	10- 26	13 3/4	+ 1/4	+1.8
	SUPPLIES & ACCESSORIES				
O	BALTIMORE BUS FORMS	6- 9	6 1/2	- 1/4	-3.7
A	BARRY WRIGHT	9- 14	11 1/2	0	0.0
A	DATA DOCUMENTS	17- 26	20 5/8	- 1/8	-0.6
O	DUPLEX PRODUCTS INC	8- 16	8 3/4	0	0.0
N	ENNIS BUS. FORMS	6- 10	6	0	0.0
O	GRAHAM MAGNETICS	15- 27	17 1/4	+ 3/8	+2.2
O	GRAPHIC CONTROLS	12- 15	12 1/2	- 3/4	-5.6
N	3M COMPANY	76- 86	82	-2 5/8	-3.1
O	MOORE CORP LTD	42- 56	55 1/8	+1 3/8	+2.5
N	NASHUA CORP	48- 62	58	+ 3/4	+1.3
N	REYNOLDS & REYNOLD	37- 77	48 1/4	+2 1/2	+5.4
O	STANDARD REGISTER	14- 20	15 1/2	- 1/2	-3.1
O	TAB PRODUCTS CO	14- 23	23	+ 1/2	+2.2
N	UARCO	21- 28	21 3/4	- 1/8	-0.5
A	WABASH MAGNETICS	6- 11	7 3/8	0	0.0
N	WALLACE BUS FORMS	21- 26	23 1/4	0	0.0
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	147-226	208 3/4	-16	-7.1
N	COLLINS RADIO	14- 20	17 7/8	+1 3/4	+10.8
N	CONTROL DATA CORP	43- 78	63	+2	+3.2
O	DATA GENERAL CORP	56-115	111	+1	+0.9
O	DIGITAL COMP CONTROL	9- 25	7 1/2	-1	-11.7
N	DIGITAL EQUIPMENT	72-101	84 3/4	-2 3/8	-2.7
N	ELECTRONIC ASSOC.	6- 13	8 3/4	+ 1/8	+1.4
A	ELECTRONIC ENGINEER.	6- 14	7 7/8	- 1/4	-3.0
N	FOXBORO	23- 41	24 7/8	- 5/8	-2.4
O	GENERAL AUTOMATION	13- 39	37 1/2	-1 1/2	-3.8
O	GRI COMPUTER CORP	2- 5	2 7/8	+ 1/8	+4.5
N	HEWLETT-PACKARD CO	46- 77	69 1/2	-2 1/8	-2.9
N	HONEYWELL INC	122-170	127 3/4	-6 3/4	-5.0
N	IBM	333-426	371 1/2	-19 1/2	-4.9
O	INTERDATA INC	8- 16	10	-1 1/8	-10.1
O	MICRODATA CORP	5- 10	8 1/4	+ 1/4	+3.1
N	NCR	29- 38	33 7/8	- 1/8	-0.3
N	RAYTHEON CO	27- 47	30 3/8	+ 5/8	+2.1
N	SPERRY RAND	30- 49	47 3/8	-1	-2.0
A	SYSTEMS ENG. LABS	7- 16	7 3/4	- 1/8	-1.5
N	VARIAN ASSOCIATES	14- 22	19 1/4	- 7/8	-4.3
N	VICTOR COMPTOMETER	15- 24	16 1/8	0	0.0
N	WANG LABS.	23- 61	27 1/4	-1 5/8	-5.6
N	XEROX CORP	121-172	150	-7 1/4	-4.6
	LEASING COMPANIES				
A	BOOTHE COMPUTER	4- 18	4 3/8	0	0.0
O	BRESNAHAN CORP.	2- 3	1 1/2	0	0.0
O	CONDISCO INC	3- 18	15	+ 1/2	+3.4
O	COMMERCE GROUP CORP	5- 11	6 1/4	- 1/4	-3.8
O	COMPUTER EXCHANGE	1- 3	5/8	- 1/8	-16.6
A	COMPUTER INVSTRS GRP	7- 14	7 3/8	+ 1/8	+1.7
N	DPF INC	5- 13	6 1/2	+1	+18.1
M	DATRONIC RENTAL	2- 4	2 1/4	+ 1/8	+5.8
A	DCL INC	3- 10	3 1/4	+ 1/8	+4.0
A	DEARBORN-STORM	16- 26	20 1/4	0	0.0
A	DPA, INC.	5- 8	7 1/2	0	0.0
A	GRANITE MGT	5- 11	6 3/8	+ 1/8	+2.0
A	GREYHOUND COMPUTER	6- 11	7 1/8	+ 3/8	+5.5
A	ITEL	7- 12	9 1/4	- 1/2	-5.1
N	LEASCO CORP	17- 24	20 3/4	+ 7/8	+4.4
O	LEASPAC CORP	6- 15	7	- 1/4	-3.4
O	LECTRO MGT INC	1- 4	2 1/4	- 1/8	-5.2
A	ROCKWOOD COMPUTER	2- 7	2 1/4	0	0.0
O	SYSTEMS CAPITAL	3- 20	9 3/4	- 3/4	-7.1
N	U.S. LEASING	19- 33	30 1/4	+ 3/4	+2.5

EXCH: N=NEW YORK EXCHANGE; A=AMERICAN EXCHANGE
L=NATIONAL EXCHANGE; O=OVER-THE-COUNTER
P=PHIL-BALT-WASH
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

Computer Stocks Trading Index



Earnings Reports

EDP RESOURCES
Three Months Ended July 31

	1972	1971
Shr Ernd	$.26	$.10
Revenue	4,758,771	3,656,149
Spec Cred	a111,256	9,938
Earnings	195,789	75,934

a-Gain on purchase of the company's 8-1/2% secured equipment notes and gain from sale of computer rental equipment for prices in excess of book value.

MICRODATA
Year Ended Aug. 31

	1972	1971
Shr Ernd	$.52	.....
Revenue	6,243,368	$2,320,509
Spec Item	a318,000	b119,853
Earnings	676,643	(1,543,508)
3 Mo Shr	.18	.....
Revenue	1,952,430	851,392
Spec Item	a100,110	b119,853
Earnings	243,722	(1,010,451)

a-Tax loss carryforward credit. b-Writeoff of good will.

DPF
Three Months Ended Aug. 31

	1972	a1971
Revenue	$8,927,000	$11,687,000
Spec Cred	20,000	.....
Earnings	20,000	b(3,344,000)

a-Restated to reflect year end retroactive adjustments. b-Includes a $42,350,000 depreciation charge and a $7,906,000 reversal of deferred income taxes.

ALANTHUS
Year Ended Aug. 31

	1972	1971
Shr Ernd	$1.18	.....
Disc Op	.....	(944,821)
Spec Item	133,625	(199,230)
Earnings	732,486	(1,141,292)

NATIONAL CASH REGISTER
Three Months Ended Sept. 30

	1972 (000)	1971 (000)
Shr Ernd	$.19	$.20
Revenue	389,689	354,065
Earnings	4,411	4,431
9 Mo Shr	a	.76
Revenue	1,100,980	1,065,076
Earnings	396	16,970

a-Income available for common stock after preferred dividend requirements equal to less than 1 cent a share.

DECISION DATA COMPUTER
Nine Months Ended Aug. 31

	1972	1971
Revenue	$1,437,978	$75,503
Loss	1,952,614	1,305,522

COMPUTER TERMINAL
Year Ended July 31

	1972	1971
Revenue	$5,410,000	$2,964,000
Loss	2,220,000	3,750,000

CONTINUOUS FORMS
- Stock Forms delivered within two days of receipt of order.
- Custom Forms designed and produced to your specifications.

ISC/PRYOR COMPUTER
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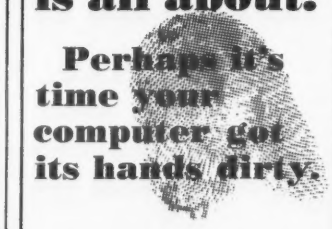
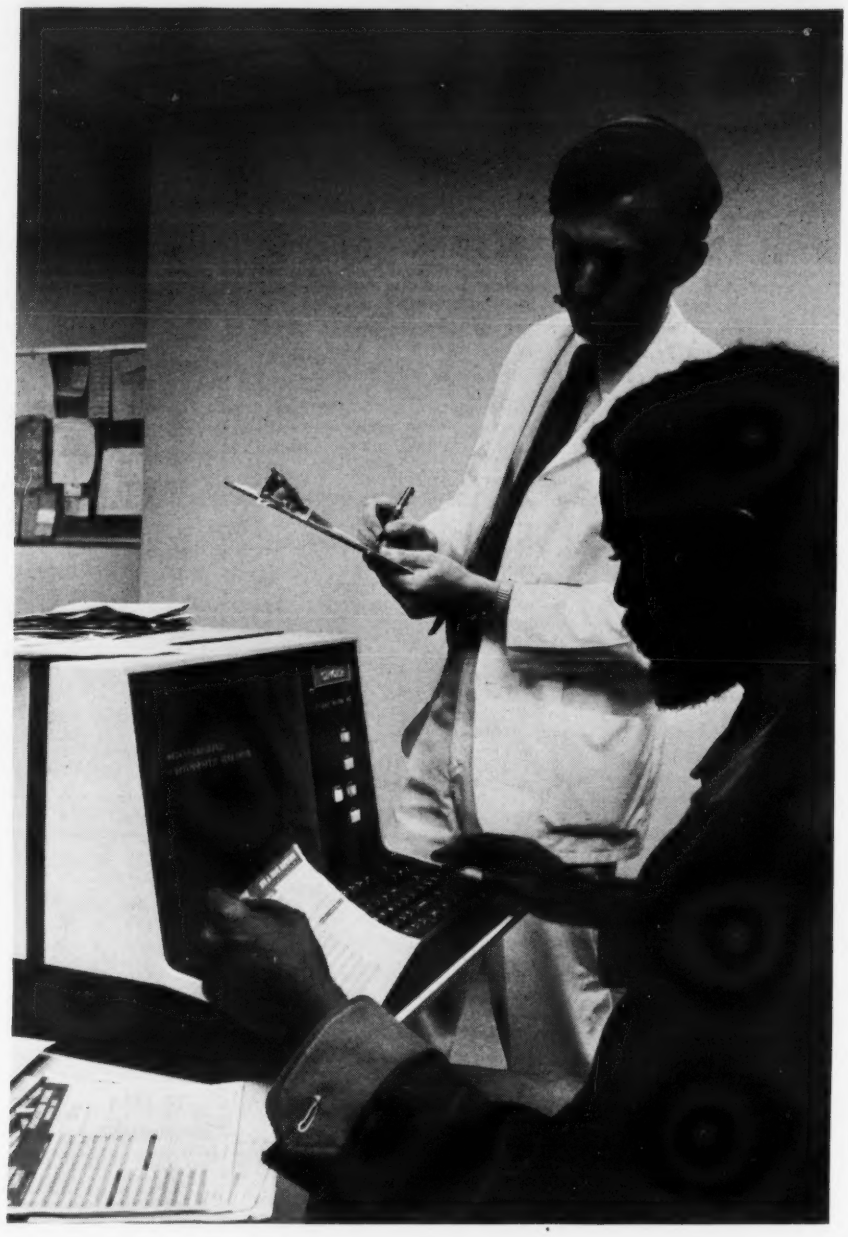
Phone: 312-644-5650
Chicago Milwaukee Indianapolis
Cleveland Pittsburgh New York Baltimore

Manufacturing information is what the Sierra 770 System is all about.



Perhaps it's time your computer got its hands dirty.

Research Corporation
Sierra
Data Systems Division
217 Middlesex Turnpike
Burlington Massachusetts 01803
Telephone (617) 273 0900



How Denver General Hospital took the emergency out of its replenishing procedures.

Denver General is a 350-bed hospital in Colorado's capital city.

Like most hospitals, it struggled with a 150-day inventory load that still couldn't eliminate expensive rush ordering.

Its accounting system could only account for about 75% of all items moving out of inventory. Which meant that somewhere along the line, 25% of proper patient charges weren't being made.

This year, Denver General installed SYSTEM TEN* computer by Singer.

Now, Denver General bills from its accounting process 100% of all inventory used.

The hospital is now working with a 30-day inventory, with virtually no rush-ordering.

Every ward and every service orders supplies through SYSTEM TEN. Files are constantly updated. The system prints out on a regular basis: balance on hand, current usage, year-to-date usage, year-to-date receipts, and current receipts. A stock status report is printed monthly, but could be done daily if needed.

Once a week, purchase orders are generated from the system, with the ability to override orders in order to increase them, decrease them, or not order at all.

Soon, another SYSTEM TEN will take over the hospital's total accounting system, following patients from admission to discharge, tracking charges, preparing bills—even preparing the General Ledger. Together, the two systems will give Denver General an automated cost accounting system.

We can supply you with all the facts on SYSTEM TEN installations for many industries. Specific case histories that include hardware, software, configuration, sample forms, costs. Just contact your nearest Singer Business Machines representative. Or write: Singer Business Machines, San Leandro, California 94577.

*A Trademark of THE SINGER COMPANY

System Ten by SINGER

SINGER Consumer Products, Industrial Products, Aerospace & Marine Systems, Business Machines, Education & Training Products.
***Business Machines Division**- producers of calculators, mailing equipment, computer systems, data transaction systems, billing/accounting systems, graphic arts equipment.*